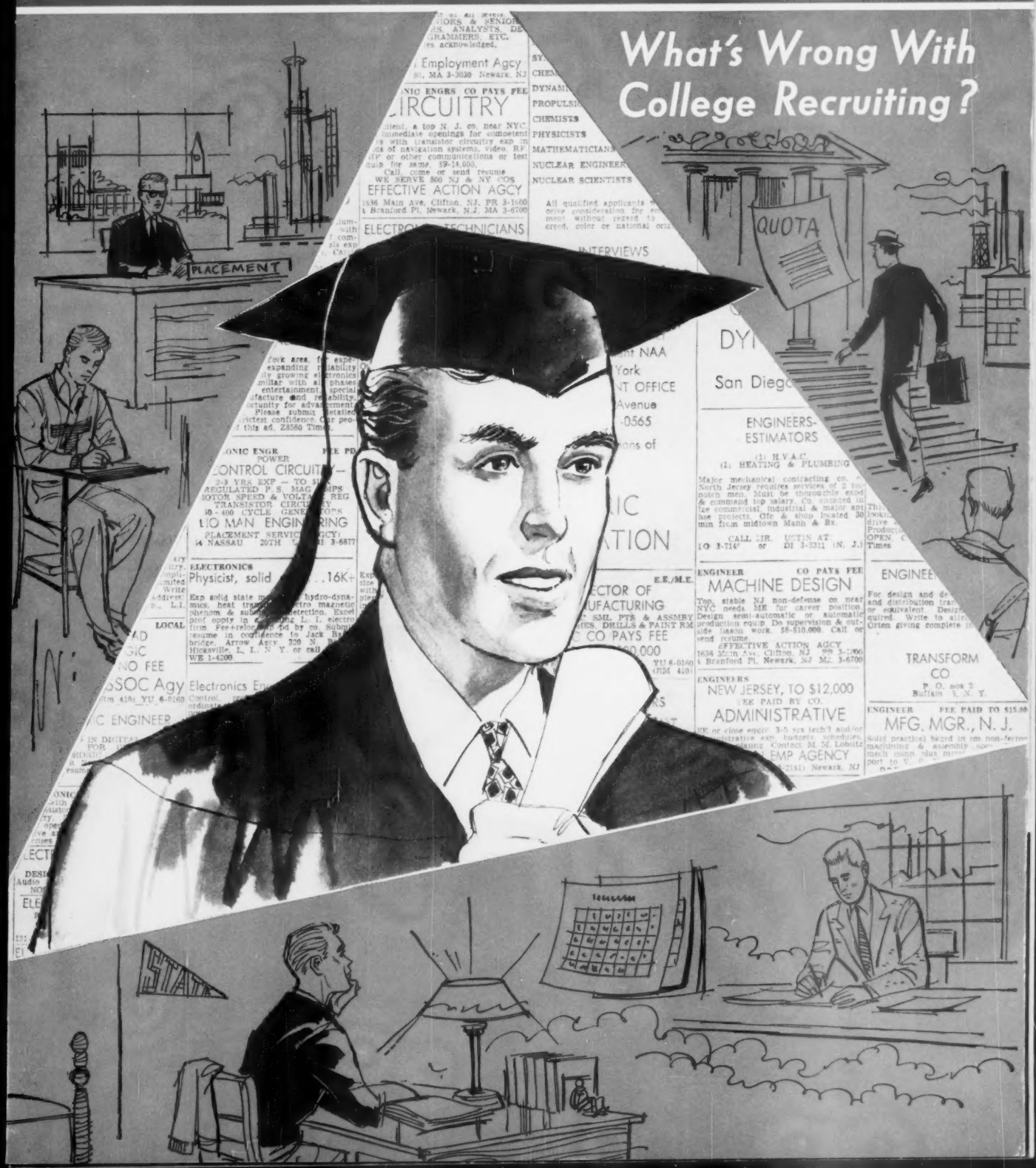
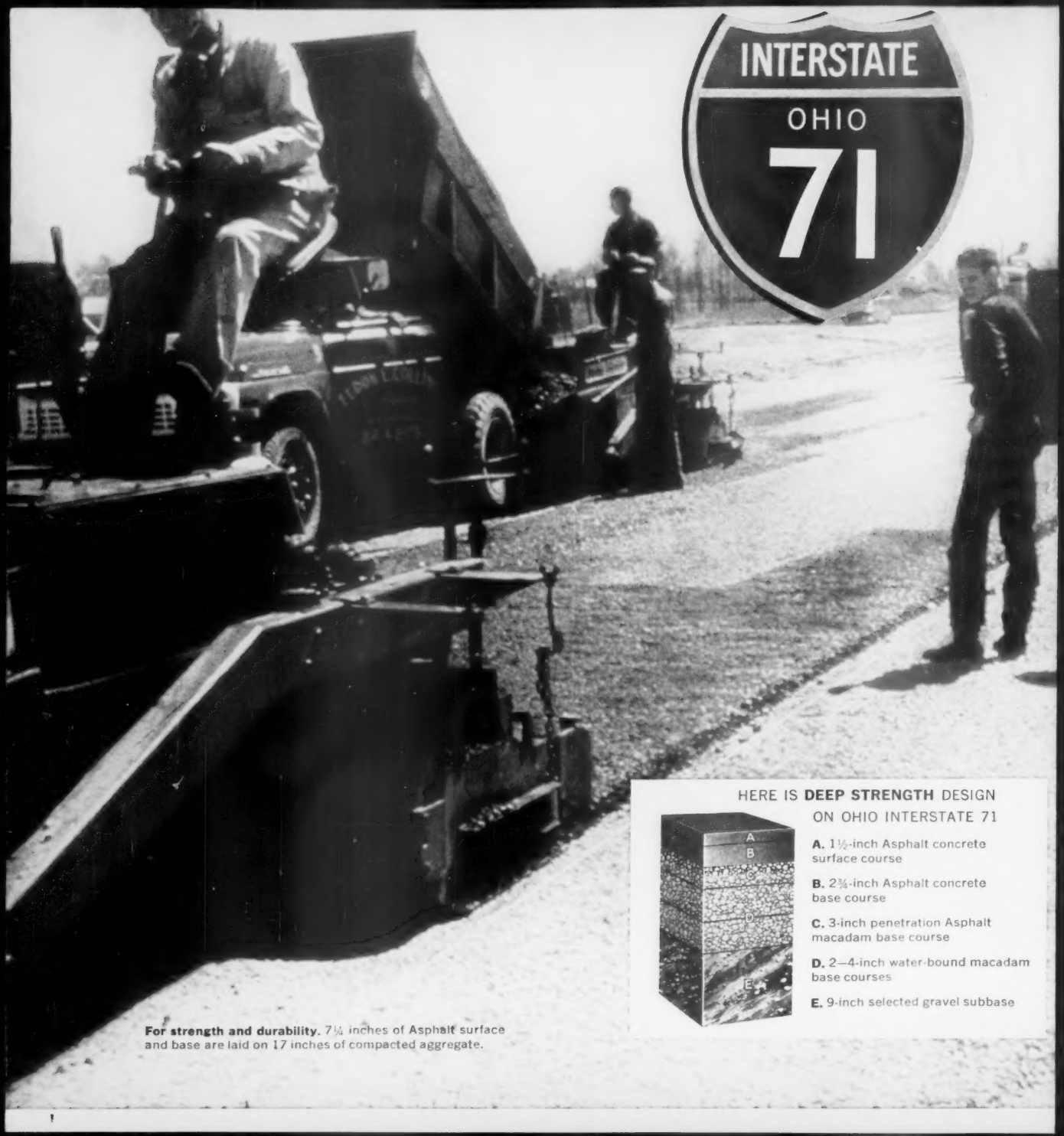
The Magazine of the Registered Professional Engineer

American Engineer

JUNE 1961





For strength and durability. 7¼ inches of Asphalt surface and base are laid on 17 inches of compacted aggregate.

HERE IS **DEEP STRENGTH** DESIGN ON OHIO INTERSTATE 71

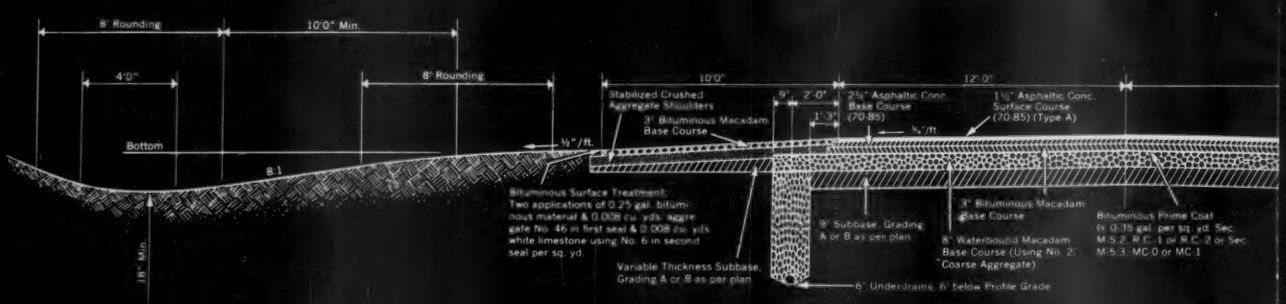
A. 1½-inch Asphalt concrete surface course

B. 2¾-inch Asphalt concrete base course

C. 3-inch penetration Asphalt macadam base course

D. 2—4-inch water-bound macadam base courses

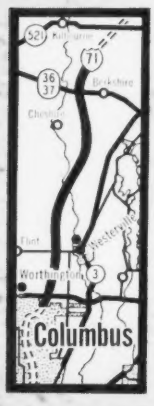
E. 9-inch selected gravel subbase


8' Rounding
10'0" Min.
4'0"
8' Rounding
Bottom
8:1
18" Min.
10'0"
12'-0"
Stabilized Crushed Aggregate Shoulders
3" Bituminous Macadam Base Course
9"
2'-0"
1'-3"
2¾" Asphaltic Conc. Base Course (70-85)
1½" Asphaltic Conc. Surface Course (70-85) (Type A)
¼"/ft.
Bituminous Surface Treatment: Two applications of 0.25 gal. bituminous material & 0.008 cu. yds. aggregate No. 46 in first seal & 0.008 cu. yds. white limestone using No. 6 in second seal per sq. yd.
Variable Thickness Subbase, Grading A or B as per plan
9" Subbase, Grading A or B as per plan
3" Bituminous Macadam Base Course
8" Waterbound Macadam Base Course (Using No. 2 Coarse Aggregate)
Bituminous Prime Coat (± 0.35 gal. per sq. yd. Sec. M-5.2: R.C.-1 or R.C.-2 or Sec. M-5.3: MC-0 or MC-1
6" Underdrains, 6' below Profile Grade

New Section of Interstate 71:

First DEEP STRENGTH Asphalt Paved Interstate Highway in Ohio!

New DEEP STRENGTH Asphalt section extends northeast paralleling existing U. S. Route No. 42.



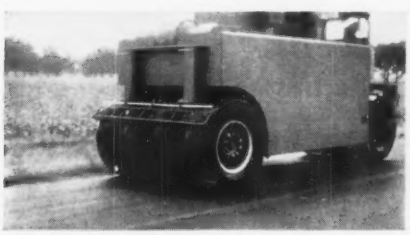
Traffic is now rolling on the first DEEP STRENGTH Asphalt paved Interstate Highway in Ohio. Serving a highly industrialized area, this new 17-mile section of Interstate 71 will be subjected to heavy freight traffic.

That's one reason why Ohio State highway engineers chose DEEP STRENGTH Asphalt pavement. Notice in the cross-section drawing (below) how design follows precepts of DEEP STRENGTH Asphalt construction . . . heavy-duty Asphalt concrete surface course . . . heavy-duty Asphalt base . . . Asphalt primed subbase . . . **depressed median and deep longitudinal drain on outside and inside shoulders for good drainage** . . . heavy proof-rolling of subbase . . . and use of high-contact pressure pneumatic proof-roller on all other courses. HERE IS STRENGTH AND DURABILITY!

When built like this—for DEEP STRENGTH—Asphalt pavements will carry heaviest traffic loads without distress . . . and with minimum maintenance cost.

And, most important, Asphalt pavements built to this Advanced Design Criteria can often save money over the cost of Asphalt pavement designed to other standards. That's because the Advanced Design Criteria permit inexpensive Asphalt base to be substituted, within limits, for more expensive Asphalt concrete surfacing, and allow reduction in total structure thickness when used in place of untreated base.

NEW HANDBOOK! A new edition of the *Asphalt Handbook* incorporating all the Advanced Design Criteria implied by the term DEEP STRENGTH Asphalt pavement is now available. Write to The Asphalt Institute.

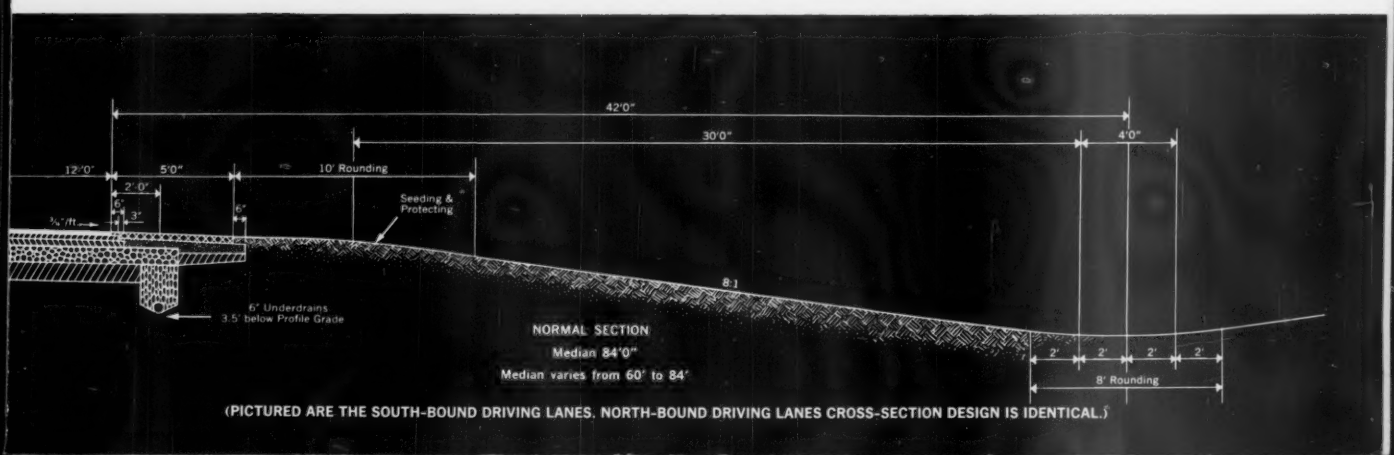


For smoother riding, the subbase was proof-rolled with a 50-ton compactor using tire pressures of 150 psi. A 30-ton rubber-tire compactor with tire pressures of 120 psi was used on all other courses.

For good drainage, section was designed with a depressed median and a system of deep longitudinal drains on each side of travel lanes to prevent water from entering the foundation courses.

THE ASPHALT INSTITUTE

Asphalt Institute Building, College Park, Maryland



(PICTURED ARE THE SOUTH-BOUND DRIVING LANES. NORTH-BOUND DRIVING LANES CROSS-SECTION DESIGN IS IDENTICAL.)

Letters to the Editor

Engineers in Service . . .

Dear Editor:

Reference is made to Mr. Antoni Tabak's letter to the editor in the February, 1961, issue of AMERICAN ENGINEER regarding the article entitled "U.S. Selective Service Compared to U.S.S.R." by Dr. Sydney B. Ingram, which appeared in your December, 1960, issue.

It is not my intention to defend or endorse Dr. Ingram's solution to the present Selective Service dilemma, but merely to give support to his statements and insinuations that those of the scientific and engineering profession who are drafted under the present Selective Service Act are not being utilized to the fullest of their capabilities, a fact which Mr. Tabak seemingly repudiates. It is my opinion that the crux of Mr. Tabak's letter can be summed up in his own words, to quote: "I spent my two years of service in the comforts of Philadelphia while my companions of basic training were shooting it out in Korea. What else would the author ask for?"

Mr. Tabak insinuates that *all* qualified graduate engineers and scientists are incorporated into the Scientific and Professional Personnel Program (now called the Scientific and Engineering Program). This is a conjecture when one realizes that only the lack of six months acceptable civilian experience acquired either during schooling or upon graduation is sufficient for disqualification in obtaining acceptance to the Scientific and Engineering Program. It is even more disheartening when one realizes that the only reason that many graduate engineers and scientists do not have this prerequisite is due to the fact that local draft boards, in their eagerness to fill their quotas, induct the college graduate almost immediately upon graduation.

I happen to fall into the above mentioned category, but fortunately (if this be the appropriate term) after six months of so-called military experience, my commanding officer acquired on my behalf, as he has done for others in my unit, a scientific and engineering rating. But this action on the part of the commanding officers is not necessarily the rule.

In the "special outfit" to which I am assigned, there are fifty-four graduate engineers and scientists out of a total of one hundred and five enlisted men.

The following points will describe the role of a scientist or engineer in this "special outfit":

(1) The individual is assigned to a particular project which is planned and directed by civilians. This limits his participation in the project to equipment moving, gauge reading, simple calculations and minor assistance.

(2) The individual more often than not is changed from project to project, never becoming familiar with any single project.

(3) Those able to continue work on their assigned projects are given the type of work that can be handled by any Army-trained specialist, of which there is no shortage.

(4) As an enlisted man, the scientist or engineer is not "qualified" for any type of work which requires planning or administration, however, he is qualified and *always* available for housekeeping duties and numerous petty details.

If such is the plight of scientific and engineering personnel in our Research and Development Detachment, woe to those drafted scientists and engineers who have no Scientific and Engineering rating.

PFC JOSEPH J. GALLIPPI, B.C.E., E.I.T.,
U.S.A. Engineering Research and
Development Detachment
Ft. Belvoir, Va.

RPI Older! . . .

Dear Editor:

Page 7 of the April, 1961, issue of AMERICAN ENGINEER contains an error. RPI (Rensselaer Polytechnic Institute) is the grandparent of all technical schools, *not* MIT. In 1924 RPI celebrated its one hundredth year, making it thirty-seven years older than MIT.

R. C. SLEIGH, P.E.
Lynn, Mass.

Dear Editor:

I would like you to answer a question.

You state in your "This Month" page of the April issue of AMERICAN ENGINEER, second paragraph and I quote, "MIT, that grandparent of *all* tech schools, . . ."

If that is so, how do you designate Rensselaer Polytechnic Institute, which was thirty-seven years old when MIT was founded?

ERIC G. SKARIN, P.E.
Canton, Ohio

► **Editor's Note: We plead guilty as charged. We hereby pronounce RPI *great-granddaddy* of all technical schools!**

Peace Corps . . .

Dear Editor:

With Russia apparently making great strides in science and technology and our own efforts in this respect lagging, for the time being at least, it seems remarkable that a publication calling itself AMERICAN ENGINEER should come out in favor of funneling engineers into the so-called Peace Corps (AE, April, 1961, P. 21).

This hardly seems the right time to go overboard for a program in which engineers would at best play third fiddle, behind teachers and agriculture specialists, as can be seen from your quotation from Rep. Reuss who seems to have a stake in the project.

Then on page 51 you quote the executive director of an organization that has been in this field for nearly

(Continued on page 6)

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American Engineer

JUNE 1961
Vol. 31, No. 6

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS FOUNDED 1934

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(Continued from page 4)

two centuries as saying, "The thing I fear most is that on a national level the program will become political, and the country will end up sending everybody and his brother out to do this kind of work." To show you how fully justified this man's fears are I enclose a clipping from the local newspaper which shows a picture of the director of the Peace Corps. Below it states that he is none other than—you guessed it—President Kennedy's brother-in-law.

The students at Pitt, however, seem to be a good deal more mature than the editors of AE. You give six quotations from their answers to the interviewer's questions about their personal reaction to the proposal. The first is a gem and deserves repeating: "I think it an imaginative proposal. It's motive is noble and sincere, and it should prove effective towards achieving its end. There is no better way of making peace than with a warm handshake." (April, P. 25)

That lad has a seat in the U. S. Senate waiting for him when he gets old enough. Twenty-three words to say it was a fine thing—for somebody else. The six quotations you give, stating that they are representative, indicate overwhelming apathy and hardly confirm the statement that it was not necessary to stretch the statistics to find overwhelming support.

Maybe our editors have been had.

JESSE YEAKEL, P.E.
Oklahoma City, Okla.

Battelle Cases . . .

Dear Editor:

With due respect to counsel, the article on the two Battelle cases, AMERICAN ENGINEER, April 1961, p. 29, was seriously misleading since the suits had little to do with the practice of patent attorneys and agents even as dictum and the court openly disavowed any intention to interfere with such practice. The solicitation of legal work by *corporations* and the practice of law by *attorneys* who perform *legal* services for Battelle's clients without a proper attorney-client relationship, was enjoined. The Ohio Bar Committee complaint nowhere urged that a patent agent could not lawfully practice from an Ohio office which the article conjures up.

LEONARD M. TODD, P.E.
New York, N. Y.

► ***Editor's Note:*** **Although the decision referred to activities of employees of Battelle, the court's opinion was broadly stated: "The work done before an administrative agency may or may not constitute the practice of law. If it does constitute the practice of law, and is done in Ohio, it must be done by attorneys who are duly licensed to practice law in Ohio. This requirement is in addition to any other proper qualifications or conditions which may be required of or imposed upon those who seek to practice before the Patent Office." Future decisions may clarify the application of this language to patent agents.**

China Revisited . . .

Dear Editor:

I cannot help but raise my voice in the thoughtful dispute over the article, "Red China's Bridge to the Future," which appeared on the pages of the March AE.

Unfortunately, the dispute has been reduced to a "giant" task on your part to prove the reliability of the *New York Times*, to justify the results of "a fine job of digging and sifting facts" which satisfied the Honorable W. G. Magnuson, U.S. Senator from Washington. (See *Letters*, May AE)

Maybe it is a surprise to you that after . . . decades mostly of "sifting" facts by the *Times* in cooperation with 91.31 per cent (8.69 per cent still are not brainwashed) of the leading newspapers, we hardly know of what we are speaking, and less do we know of what we are doing today.

We are permitted to worry about future Chinese bridges while the "most superior public service" is pushing this nation to cross the bridge between the animal farm and the year 1984, far ahead of the Orwellian time table. The bridge, built by our own Frankensteins . . . could be open to traffic at any time.

GEORGE T. VASLEY, P.E.
Harrisburg, Pa.

Students & Unions . . .

Dear Editor:

As an industrial engineering graduate student and EIT looking forward to obtaining my professional license, I greatly enjoy reading your magazine each month. I find your various articles and comments on the unionization of professional engineers especially enlightening.

So far, it can be said that the unionization of engineers has resulted from factors such as economic depressions, change in status, legislative measures, and the growth of rank-and-file unions. Present day factors include the large size of some technical staffs and poor supervision. The extent of this unionization has been small, to be sure, but the interest in it is great among graduating engineering students . . .

Engineering unions is just one of the many interesting topics covered in each issue of your fine magazine. I enjoy the other subject matter also. Keep up the good work!

JOHN E. KOOP, EIT
State College, Pa.

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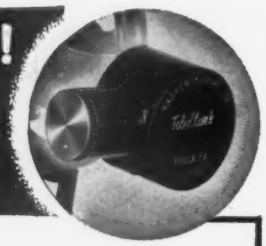

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"This Month"

What is wrong with college recruiting of engineers? Industry isn't satisfied . . . graduates aren't satisfied . . . colleges are unhappy. What, if anything, can be done? Read this up-dated report—page 21.

Here is a new thought: "Let's Have Archineers." That's the title and it begins on page 27.

Engineering in Dixie. Here is a real New Frontier! This comprehensive staff study of the great advances in technology below the Mason-Dixon line begins on page 30.

And page 35 brings us a complete review on PE's and money! We take a further look at the new NSPE survey as well as a general sighting at the entire salary picture among the professions.

Unity of the engineering societies always rates attention and "This Month" we present on page 40, "Toward a More United Profession," written for us by Past President Garvin H. Dyer, P.E.

To round out the lineup check the AE Special Report on the engineer's future in the Government, page 33 . . . Board of Ethical Review case on practicing in other than major field, page 34 . . . and Programs, Problems, and Priorites at Purdue, page 37. And, by the way, why not attend the Annual Meeting in Seattle in July? See page 44.

In the news "This Month":

General. Page 8. Summing up the stories: Figures released from NSPE's latest salary survey . . . L.A. industrialist says we still need nonconformists . . . Highway week stresses need for roads . . . ACS membership worried over status . . . Michigan educator says India is moving technologically.

Consulting. Page 11. The headlines: Ohio Court Hits Engineer for Doing Architect's Work . . . House Approves Funds to Finish Interstate Highway . . . Keogh-Utt Bill Gets by Ways & Means Committee.

Education. Page 13. The new winners of the NSPE-ARMCO civil engineering scholarships have been announced and the young lads hail from Miami to Sante Fe. In other stories we report on (1) the increase in engineering enrollment at Cornell and (2) the winners of the 1961-62 Tau Beta Pi fellowships.

Industry. Page 15. Leading engineers wouldn't say "no" to a job change if the right offer comes along, so says a new study. In other news we learn that the Air Force has moved to curb funds to industry that the latter has been using for recruiting. And to complete the coverage we find stories on industry training programs . . . A look at a possible increased shortage of engineers . . . And new union drives directed at Dayton, O., professionals.

Government. Page 17. A study group is drafting a revised bill on a Department of Science . . . A late story on better opportunities for government engineers . . . Technical competence pay under consideration by Pentagon . . . Montana SPE calls on State Highway Dept. to cancel union contract covering PE's . . . "Sidebar" organizations to be subject of quiz.

That's it for June.

Kenneth E. Trombley

Editor

NSPE Salary Survey Shows Salaries Up Since 1958

From the standpoint of salary, the American professional engineer continues to gain increased recognition for his work. This is the conclusion drawn from a survey of over 24,000 engineers, conducted and published by the National Society of Professional Engineers of its members.

Median income for those engineers responding to the survey reached a new high of $10,660—up by 6.6 per cent from a similar survey taken in 1958. Further, this increase is reflected at almost all salary levels. The median income figure represents the point at which half of all those surveyed are making a smaller figure, and half are receiving a greater income.

Ninety per cent of the engineers surveyed received salary or income over $7140 in 1960, an increase of $100 over 1958. Three-fourths of those surveyed made in excess of $8580, up from $8250 in the previous survey. The top 25 per cent of those answering earned $13,750 or more, an increase in that category from $13,620 in 1958. Only for the top ten per cent was the decile level unchanged, remaining at $19,680.

This year's survey included 24,326 respondents, up from 18,713 in 1958. Among the reasons for this were a greater number of engineers-in-training and introductory members. Compared with a broader survey of some 200,000 engineers by the Engineers' Joint Council, NSPE engineers are making more money by approximately eleven per cent.

The NSPE survey, which received answers from over 40 per cent of the Society's members, is one of a series conducted and published every two years. The 6.6 per cent median increase is greater than the five per cent figure between 1956 and 1958 but less than the changes recorded for the two preceding surveys—nine per cent in 1954 and twelve per cent in 1956.

The survey indicated that the New England/Middle Atlantic states offered the most lucrative section of the country for the engineer, particularly for the engineer in the higher grades of his profession. By grade and area, the highest median salaries looked like this: Grade I—too few respondents to compute; Grade II—West, $6810; Grade III—Midwest, $7120; Grade IV—New England/Middle Atlantic, $9130; Grade V—New England/Middle Atlantic, $10,990; Grade VI—New England/Middle Atlantic, $13,500; Grade VII—New England/Middle Atlantic, $16,660; and VIII—Midwest, $24,930. Grading is done by the engineer himself on the basis of duties, job title and responsibilities.

Medians by grade for the total United States were as follows: Grade I—$5570; Grade II—$6230; Grade III—$6890; Grade IV—$8640; Grade V—$10,450; Grade VI—$12,260; Grade VII—$15,520; and Grade VIII—$21,930.

For the young engineer as well as the average engineer, the salary picture is equally rosy. In tabulation by year of entry into the profession there is a steady increase in starting salaries from 1952, representing a rise over the eight year period of nearly 25 per cent. (See Opposite Page.)

Nonconformists Are Needed Says L.A. Industrialist

Firing the nonconformist in a technological establishment because he doesn't think with the group is like throwing the baby out with the bath water, says a prominent Los Angeles industrialist.

K. F. Julin, president of the Leach Corporation, told a west coast club recently that, on the contrary, "we must create broader opportunities for nonconformists in our businesses since they represent the new ideas on which our future success may depend."

Mr. Julin, speaking on "Management Takes a Look at Itself," said that many of the frictions and conflicts which plague business and industry today may be attributed to supervisors who are insensitive to "the needs, problems and anxieties of the people with whom they work."

"People," Mr. Julin declared, "are still the key to successful management despite our fast technological changes. This is no different than it ever was; but because these changes occur faster, we must plan better and improve our timing if we are to maintain a competitive edge."

The industrialist, who heads one of the oldest electronic firms in the U.S., advocated giving as much weight to the ability of management personnel to understand others as to their technical or production skills, and concentrating more on developing further the strengths of people to make the existing man better, rather than remaking him.

President Recognizes National Highway Week

A proclamation from President Kennedy issued last month declared National Highway Week, as May 21-27, 1961, in recognition of "the vital role of highway transportation in our way of life."

The proclamation urged state governors to issue similar proclamations in observance of the occasion. Noting the increased need for highway safety, the progress and planned expansion of the National System of Interstate and Defense Highways, and the need for better use of highways to reduce the annual waste of human and economic resources, the President urged citizens to "judge the value of highway transportation to their own activities and to our National welfare."

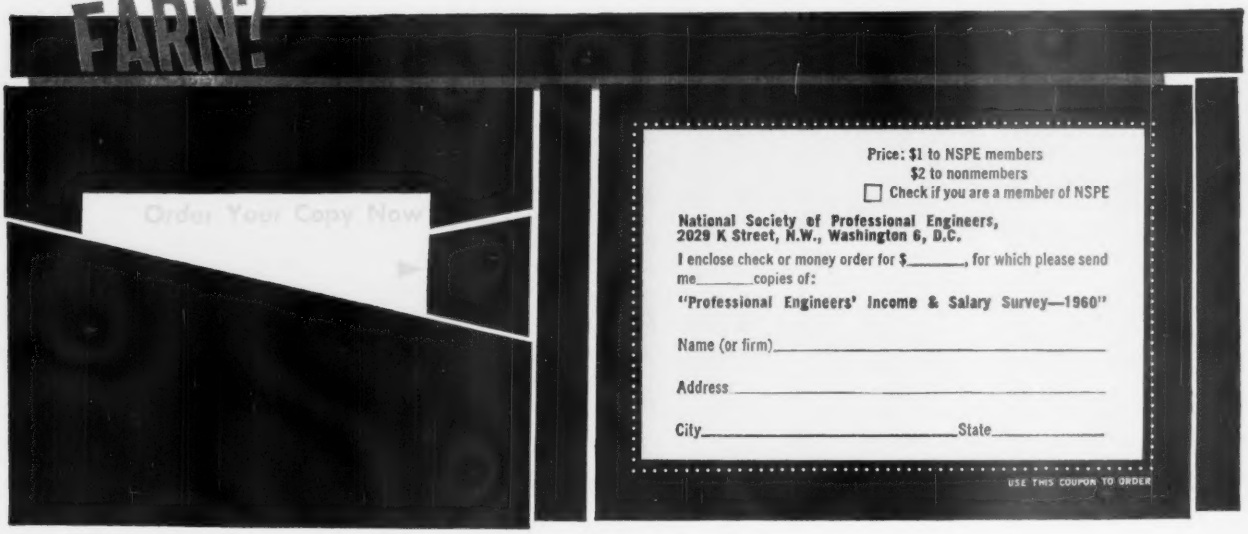
WHAT DOES A PROFESSIONAL ENGINEER EARN?

The National Society of Professional Engineers' latest **PROFESSIONAL ENGINEERS' INCOME & SALARY SURVEY** profiles the current engineering salary situation through a study of 24,000 registered engineers.

This 5th biennial survey in NSPE's long-range income and salary study program organizes survey data to present specific answers to such questions as:

- Which of the major engineering specialties has the highest median earnings?
- In what fields have professional engineers achieved the largest gains in total earnings over the period 1952–60?
- How do engineering salaries compare in the fields of education, public utilities, industry, government and private practice?
- How much, percentagewise, have engineer earnings increased throughout the country during the period 1952–60?

A detailed picture of engineer earnings by year of entry into the profession, by geographical region, by type of employer, by engineering specialty, and by other categories. Comparative earning figures from the 1952 through 1960 Surveys make it possible to evaluate broad engineering income and salary trends for an eight-year period.



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(Continued from page 8)

ACS Poll of Membership Shows Concern for Status

In a recent poll on professional status, the American Chemical Society discovered that 88 per cent of its members felt there was a problem in the lack of full professional status in the eyes of the general public and their employers for themselves.

The poll was taken at the recommendation of the ACS Council in view of the increasing interest shown by ACS members in professional matters. The survey attempted to determine how members define "professional status," how great a problem exists on the matter, and what could be done to solve any such problem. The results will be used to develop a professional relations program for the society.

The poll revealed that of the 88 per cent who felt a problem existed regarding professional status, only 24 per cent felt that the problem was serious. The poll also showed that ACS members attribute any lack of status primarily to low pay, lack of autonomy in research, low status on the job, and inadequate public appreciation of the importance of their work.

To help improve professional status, a majority of the members favors such ACS activities as seeking greater publicity for chemists and chemical engineers, encouraging discussion of professional topics among college students and developing a code of ethics. Eighty per cent of the members indicated opposition to joining unions, but 60 per cent felt that ACS should collect and publish information on unions without taking a positive stand on the issue.

One interesting fact also revealed in the survey is that more members opposed the use of academic degrees after authors' names in journals than support the idea.

Social Research, Inc., an opinion analysis concern in Chicago, conducted the survey in three phases: Personal depth interviews of members, detailed questionnaires mailed randomly to members, and interviews with nonmembers.

Technological Advances Witnessed in India

India is making a great effort to advance its technology and is making rapid progress, reports Michigan State University's dean of engineering.

Dr. John D. Ryder recently returned from an inspection of two Indian engineering colleges which MSU will be assisting through a contract from the International Cooperation Administration.

"They are trying to industrialize," he said of the Indians, "and they are trying to do it with a minimum of foreign exchange. Sometimes this means doing it more expensively than they could with foreign help but at least they are keeping their own people busy. This might be best for them.

"They have already developed basic industries—steel, aluminum and cement, for example—and are beginning to move into lighter manufacturing and, to some extent, consumer goods.

"They have realized that they have a shortage of technical personnel and are trying to do something about it. That is why we and other universities are over there helping them to educate engineering teachers in their colleges and universities."

He pointed out that the Indian government is sponsoring a program which supports students studying for masters degrees in engineering for two years. However, they have to agree to teach for three years after they graduate.

Dean Ryder said the engineering schools in India have adequate facilities and at least the minimum amount of equipment that they need. He added that MSU staff members who go to India to assist the engineering colleges will find their living accomodations satisfactory.

Michigan State, he said, will help the Indian government establish teacher-training programs in engineering at Guindy College of Engineering in Madras, and Poona Engineering College at Poona, near Bombay.

Dean Ryder was accompanied by Horace C. King, assistant to the dean of International Programs, MSU. The two also visited Michigan State projects on Taiwan and Okinawa.

Where Praises Are Due . . .*

Major Yuri A. Gagarin is a world hero because he risked his life to ride in a vehicle over which he had no control. He was virtually a passive passenger in a space ship designed, built and operated by others. Dogs and other animals had made similar trips before him.

Amid the well-deserved clamor of praise for Major Gagarin may we not have at least a faint cheer for the real heroes, the engineers who made this flight possible?

The scientific principles which govern a space flight are relatively simple. The problems of applying those principles to the design and operation of a successful space vehicle are incredibly complex. All honor belongs to the engineers who solved those problems and who thereby made possible man's first flight into space.

ELMER C. EASTON
Dean, College of
Engineering, Rutgers

* From *The New York Times*, "Letters to the Times," P. 36M, April 19, 1961

Ohio Court Hits Engineer for Doing Architect's Work

A registered professional engineer, who entered into a contract to design and perform other services in connection with the construction of several college buildings, has been denied recovery of his fee on the ground that the contract primarily called for architectural services. The decision was handed down by the Court of Common Pleas, Jefferson County, Ohio.

In this case, the engineer signed a contract, entitled "Agreement between owner and engineer," under which he was to perform professional services for the College of Steubenville. Such services were to include "necessary conferences, the preparation of preliminary studies, working drawings, specifications, large scale and full size detail drawings, for architectural, structural, plumbing, heating, electrical and other mechanical work." The college claimed the contract was void and unenforceable since the plaintiff was not an architect so could not perform the services of an architect which are called for in the contract.

The engineer based his claim on provisions in both the engineering and architectural registration laws which give practitioners in both professions the reciprocal right to perform work in the other field "as may be incident" to the practice of his profession. The engineer also relied on the fact that the architects' registration law does not contain a definition of "the practice of architecture," whereas the definition of engineering practice is worded so as to include "any professional service, such as consultation, investigation, evaluation, planning, design, or responsible supervision of construction or operation" in connection with any structure, building, project, etc.

Deciding in favor of the college, the court pointed out that Ohio law recognizes distinction between an architect and a professional engineer in terms of education qualifications and experience. On the other hand, the court said, the legislature recognized an overlapping when it provided that either profession could engage in the practice of the other as may be incident to the practice of his particular profession.

"It is the opinion of this Court that the legislature intended to and did establish two separate professions, and intended to and did protect each of said professions in their respective fields of endeavor; that the legislature recognized that each of said professions have some things in common and that there is bound to be some overlapping, and the legislature provided for this."

The Court concluded that in the instant case, the contract calls for the building and construction of college buildings which primarily and predominantly call for the services of an architect and not such as are incidental to engineering. "The court finds that the contract primarily calls for the services of an architect, although there may be some incidental engineering work involved. Therefore, the plaintiff, an engineer, would be precluded by virtue of the . . . statutes from entering into such a contract. The labelling of the contract 'Agreement between Owner and Engineer' would not alter this situation since the primary purposes of the contract call for the services of an architect and not an engineer. It is therefore the opinion of this Court that the plaintiff cannot maintain his action against the defendant. . . ." (*Fanning v. College of Steubenville*, Case No. 48,328, Common Pleas Court, Jefferson County, Ohio, April 27, 1961)

House Approves Funds to Finish Interstate Highway

With relatively minor changes, the House of Representatives has passed by voice vote the Administration's bill to authorize $11 billion to complete the interstate highway system by 1972, as originally scheduled.

Principal features of the bill include a revenue-producing continuation of the present 4¢-a-gallon Federal gas tax and increases in taxes for truck tires, trailers, inner tubes and tread rubber. All of these measures had been called for by President Kennedy, who said in his highway message to Congress that the program would bog down unless his recommendations were approved. The House failed to sharply increase taxes on heavy trucks, as Kennedy had requested, preferring instead to take $150 million from the general treasury fund.

As passed by the House, the stepped-up authorizations would run as follows through the end of the program in 1962 in millions of dollars: 1963—$2400; 1964—$2600; 1965—$2700; 1966—$2800; 1967—$2900; 1968—$3000; 1969—$3000; 1970—$3000; 1971—$2885.

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Keogh-Utt Bill Gets by Ways-Means Committee

The Keogh-Utt self-employed retirement bill has breezed through the House Ways and Means Committee by a vote of eighteen to five. Backers of the measure feel it is virtually certain to again pass the full House by a comfortable margin, and hope for action within a few days.

Representative Eugene J. Keogh (D.-N.Y.), long time sponsor of self-employed retirement legislation, said the lopsided Committee vote indicated true bipartisan support for his bill in the House. "We have taken a big step in the right direction," said Keogh, "and I am confident that after ten long years of waiting H.R. 10 will be enacted into law."

So far in the Senate, three self-employed retirement bills have been introduced, all by members of the key Finance Committee. Two of these bills are identical to the NSPE-backed Keogh-Utt bill.

It is believed that the Finance Committee will hold up action on these bills pending final clearance of H.R. 10 by the House. In addition, it is expected that Committee members will want to get the approval of the Administration through the Treasury Department before endorsing self-employed legislation. Several key posts in the new Treasury Department have only recently been filled, and the Administration has requested that Senate action be held up until the new Treasury appointees have had enough time to look over the legislation.

Saturn Stand

The 204-foot-high Saturn "Dynamic Test Stand," in which the giant space vehicle's early three-stage flight model and second generation C-2 configuration will be assembled and tested, nears completion at George C. Marshall Space Flight Center. Shown above, the structure contains some 600 tons of structural steel, incorporates an electric elevator, a 75-ton stiffleg derrick and a 50-ton auxiliary hoist.

Expiration Dates for State Licenses

The following tabulation of expiration dates of state certificates for the practice of engineering covers those states in which the expiration dates occur during the third quarter of the year. Similar lists will be published quarterly in the AMERICAN ENGINEER for the information and convenient reference of registered engineers.

July 1—

Illinois

July 31—

Indiana
Wisconsin (biennially)

September 30—

Alabama

Michigan—Three years from date of issuance
New Mexico—Last day of registrant's birth month

Winners of NSPE-ARMCO Scholarships Announced

The Armco Foundation, in cooperation with NSPE, has again awarded four-year scholarships to five outstanding high school seniors planning to study civil engineering.

The winners will receive a total of $3000 in annual stipends of $750 each during their four years in college. Competition for the scholarships was steep, with students from public, parochial and private schools in each state applying. Candidates were required to rank in the upper one-fourth of a graduating class.

This year's winners are: Jeffrey Martin, Miami, Florida; Samuel Morris, III, Denville, New Jersey; David Pedersen, Watson, Minnesota; William Rogers, Logansport, Indiana; and Andy York, Santa Fe, New Mexico.

A selection committee consisting of professional engineers holding membership in NSPE and representatives of the Armco Drainage & Metal Products, Inc., a subsidiary of the Armco Steel Corporation, awarded the scholarships. Funds for the scholarships are provided by The Armco Foundation, an educational and charitable organization established by Armco Steel Corporation.

The scholarship is continued the full four years provided that the student meets personal and scholastic standards satisfactory to the college he attends. Any college accredited by the Engineers' Council for Professional Development may be selected by the winners.

In addition to the grants to individual winners, privately endowed schools in which scholarship winners are enrolled receive an unrestricted grant of $500 annually from the Armco Foundation each year the scholarship is in force as a cost-of-education allowance. Tax-supported colleges receive a yearly allowance of $100.

The awards are granted on the basis of a student's scholastic record and his aptitudes for engineering.

Thailand to Acquire First Nuclear Reactor

Thailand is well on the way to acquiring its first nuclear reactor for peaceful research on atomic energy. Construction of the reactor by an American firm is expected to begin soon.

The University of Michigan through its Phoenix Project is helping the Thais with their project. Professor William Kerr flew to Bangkok recently to advise the Thai government on training scientific personnel and on planning a reactor program for use in connection with their one megawatt, swimming pool type research reactor, which will be similar to the U-M's Ford Nuclear Reactor. Discussion will also include laboratory design.

Thailand is one of about twenty nations the U-M has assisted with atoms - for - peace programs. Since 1956 the University's Phoenix Project has carried out such assistance to underdeveloped nations through a contract with the International Cooperation Administration.

In 1957, Professsor Kerr first visited Thailand to discuss the training of persons to administer and set up the research and reactor program.

Engineering Students at MSU to Work with Models

A new concept in engineering education has been developed at Michigan State University which could help solve a major national problem—seeing to it that engineering students learn to cope with today's increasingly complex technology.

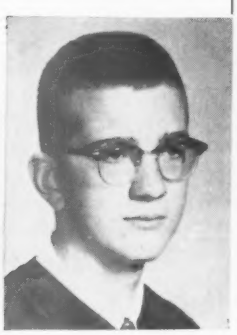
Winners of NSPE-ARMCO Civil Engineering Scholarships

Jeffrey Martin
Miami, Fla.

Samuel Morris, III
Denville, N.J.

David Pedersen
Watson, Minn.

William Rogers
Logansport, Ind.



Andy York
Santa Fe, N.M.

Formed by Dr. Herman E. Koenig, Dr. William A. Blackwell and associates in the MSU electrical engineering department, the new concept saves money by virtually eliminating all need for expensive heavy machinery. But even more important, it cuts across electrical, mechanical and other traditional engineering disciplines to ready students to deal with one of the modern engineer's major concerns —the design of systems. These can be guidance systems for missiles, automation systems for factories or other networks composed of different kinds of parts.

The new systems concept improves communications among the traditional engineering disciplines by providing a common mathematical language.

"By giving us a high level of mathematical precision, this new language enables us to use electronic computers more effectively in solving engineering problems," Dr. Koenig explained.

With the new concept, MSU students no longer need to study mechanical, electrical and hydraulic networks as separate subjects. These areas can now be covered in one course, requiring only one set of engineering concepts, rather than three.

Effects of the change at MSU can be seen in the electrical engineering laboratories. The traditional heavy, expensive and space-demanding industrial machinery has been replaced by small circuits, motors and other components which can be arranged into systems on laboratory benches.

Engineering Enrollment Increases at Cornell

Engineering enrollment at Cornell University has increased for the first time in three years, Dale R. Corson, dean of the College of Engineering, has announced. The increase shows Cornell ahead of the National trend in engineering enrollment which, while still showing a slight decrease, has gone down less than in any year since 1957.

Officials are encouraged by the enrollment figures, which they feel may reveal a return to a more normal yearly increase in this area, comparable to increases in other fields. "The recent upward trends in engineering enrollments have represented a swing back to a more normal situation," Dean Corson comments.

At Cornell, the entire enrollment in the College of Engineering has gone up two per cent, while freshman enrollment has jumped ten per cent over last year. This is well ahead of the National figure, which shows an increase of 1.2 per cent in freshman enrollment in the fall of 1960. Total enrollment in engineering throughout the nation has remained at about the same as last year.

U. S. Office of Education officials Wayne E. Tolliver and Dr. Henry H. Armsby comment: "There is an early indication that within the next year or two, total undergraduate engineering enrollments may once again show annual increases typical for this major field of study."

Dean Corson says that while Cornell is ahead of the National trend, the University has followed the National pattern rather closely in the past. Cornell's figures may indicate a National increase in engineering enrollment within the next several years.

Two factors, the Cornell dean feels, have contributed to the recent downward trends in engineering enrollment. "The launching of the first satellites was followed by a great deal of talk about science, and young people flocked to the physical sciences and to mathematics," he says.

Another factor affecting the trends, he says, is that during the recession of 1958 a number of large contracts were cancelled and engineers lost their jobs. "It will be interesting to see," he says, "if the present recession is accompanied by a decrease in engineering enrollments again."

"Do you mean to stand there and tell me that what you don't know about engineering probably isn't worth knowing?"

1961-62 Tau Beta Pi Fellowships Announced

Seven young engineers have been selected by Tau Beta Pi, honorary engineering fraternity, for graduate fellowships in 1961-62. Fellowships are awarded on the competitive basis of high scholarship, campus leadership and service, promise of future development in the engineering profession, and need for financial assistance in graduate work. Applicants are members of Tau Beta Pi and may select their own institution for study.

The complete list of this year's winners is as follows: Peter F. Lambert, New Haven, Conn., who will study at Yale; Erlind G. Royer, Kalispell, Mont., who will study at Stanford University; Clemens M. Thoennes, Atlantic City, N. J., who will study at Rutgers; Eddie L. Walker, St. Clair Shores, Mich., who will study at Wayne State University; Franklin D. Coffman, Jr., Pittsburg, Calif., who will study at Carnegie Institute of Technology; Dominic A. Di Cicco, East Detroit, Mich., who will study at Purdue; and Leroy R. Hettche, Baltimore, Md., school undecided.

The four-member Fellowship Board which selected this year's winners consists of: Paul H. Robbins, director of fellowships for Tau Beta Pi, NSPE executive director; Ralph S. Healy, retired engineer, formerly with the New York Telephone Company, New York City; Joseph C. Wagner, supervisor of industrial relations, The Texas Company, Beacon, New York; and Emanuel A. Salma, assistant dean in charge of the engineering evening division, New York University, New York City.

Survey Shows Top Engineers Considering Job Changes

"A New Look at Engineering Attitudes," a depth interview survey by Deutsch & Shea, Inc., shows that in spite of gains in recent years, a great number of engineers in industry are still unhappy with their lot, and would change jobs if the right offer came along.

Most engineers recently surveyed felt they could almost always improve their salary, status, and working conditions merely by changing jobs.

When asked what they considered the "right offer," however, the 131 engineers questioned made it clear that their price was high. In addition to at least twenty per cent salary increase, half wanted stock purchase plans, payment of relocation expenses, and higher miscellaneous fringe benefits. Forty-one per cent wanted higher professional status and responsibility and more recognition. Location and living conditions were mentioned as important factors by 33 per cent.

In addition, the survey shows that:

- Engineers and managers have different values, and neither group can understand why the other does not share its points of view.
- Company image is all-important to engineers who are job-shopping. Although 77 per cent of engineers read recruiting ads "regularly," they do not really believe what they see. Over three-quarters form company images from what other engineers tell them, no matter how biased this information may be.
- Money is evidently more important to engineers than they like to admit. Seventeen per cent said the primary reason for their last job change was higher pay, but 46 per cent felt that *other* engineers had changed for this reason.
- Engineers feel that job-changing and salary level are related. "Those with a reasonable number of changes are higher on the pay scale than those who stay with one company."

AF Moves to Curb Flow of Funds to Industry

In an apparent effort to curb Government payment of industry recruiting expenses, the Air Force has just established a regulation to provide for the stricter review of "engineering service" subcontracts.

Section 1003.903-52 of the Air Force Procurement Instructions states: "Certain 'engineering service companies' are in reality no more than employment agencies whose services may not be responsible or necessary in the performance of AF contracts. In reviewing proposed subcontracts with such companies, ACO's will determine the need for, and reasonableness of, the services involved."

Training Programs Should Suit Individual Graduate

College placement directors answering a recent *Management Record* survey would like to see company training programs tailored to individual graduates, rather than the other way around.

Thirty-five per cent of the twenty-six companies have formal graduate training programs. Forty per cent have on-the-job training, and 25 per cent have no special program for graduates. But 60 per cent of students would prefer a formal program, and 30 per cent want on-the-job training.

"My general impression is that training programs are shorter . . . feature more concrete work assignments, and cost employers less than ten years ago."

"Students with poorer records often like the 'security' of a training program—almost a postponement of the necessity to 'work.' The more competent often seek immediately productive positions."

"What I think is of prime importance is the attitude of management. . . . If management intention is good, if it means what it says . . . if it does take a long range view toward management development . . . then the particular method of training is not too important."

In general, the placement directors favor formal programs because they ease the campus-business transition, give the trainee the "big picture," and help him find the best spot for his talents.

The biggest drawbacks are felt to be slowness—trainees do not get a chance to prove themselves soon

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enough—and wastefulness—formal programs cost companies more than graduates are worth.

Goodyear Chemists Win Right of Separate Vote

Process control chemists at Goodyear Rubber's Houston, Texas, plant will get a separate decertification vote even though part of a larger contract unit.

The company and the International Union of Operating Engineers, AFL-CIO, agreed in 1958 to exclude the chemists from a production election. The union won, and in a later election also won bargaining rights for the separate unit of chemists.

Since then, the union has treated the chemists as if they had no separate status, lumping them with production workers in bargaining and contract negotiations. When the chemists sought a decertification vote, the union claimed the over-all contract unit was the only one appropriate for such an election.

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The NLRB majority, however, said the separate status held by the chemists in 1958 entitled them to separate status now, bargaining history notwithstanding. The chemists reasonably expected in 1958 to keep their separate status, said the Board, and anything the union and company did since then should not deprive them of separation.

John Fanning, in a dissenting opinion, argued that the bargaining and contract history of a unit is all important and quoted previous cases in support. The majority said that only one of his cases was pertinent and that it should be over-ruled. The majority stipulated, however, that if the chemists vote to retain the union this time they will be represented by the over-all production unit.

Two Sources Foresee New Shortage of Engineers

"In no time at all, industry is going to be hobbled by another severe shortage of engineers," claims *Dun's Review* and *Modern Industry* in its current issue, "and industry is doing little to cut the inevitable effects. Few business men, in fact, are even aware of the fast-approaching crisis."

"All companies won't be hit equally hard by the shortage," however, for some companies with glamorous products such as missiles and satellites may succeed in drawing all the engineers needed. "Less fortunate are manufacturers of such products as cranes, trains, and kitchen sinks."

Accounting for the certain future scramble is the fact that "the number of freshmen entering engineering colleges has dropped sharply in the past three years. Even if a business recovery should spark a miraculous reversal of the trend this September, the upturn in enrollments wouldn't have much effect for four or five years—the time it takes a student to graduate."

Meanwhile twin factors—technological progress and Russian pressure—are creating new, more complex jobs for engineers. Even now, industry leaders report difficulty in filling many specialized technical openings. And salary competition for young graduating engineers continues brisk.

Dun's Review sees much of the coming shortage as the result of past industry shortsightedness. A few years back, government contract cancellations were reflected in wholesale firings of engineers—a panic action which caused youngsters entering college to shy away from the profession. The magazine also cites broad sentiment within the profession for strong measures to build and strengthen the professional standing of the engineer as well as to publicize his essential role in engineering advances mistakenly called "scientific breakthroughs."

Electrical Workers Launch Dayton Membership Drives

The International Union of Electrical Workers, AFL-CIO, has launched drives on two big Dayton-area units of professional, technical and clerical employees.

At the Frigidaire plant, the IUE continues its campaign begun last September. At that time the union won a large unit of technical employees at the nearby Chrysler Air Temp Division, and began its move to organize more than 4000 white collar employees at the Frigidaire plant.

In a new drive at the National Cash Register plant, the IUE seeks to take a unit of 4500 professional, technical and clerical employees away from the NCR Independent Employees Union, whose contract will expire in October. The independent union also represents NCR's production workers, currently the target of a United Steelworkers' drive.

Employees of both companies have begun receiving mass mailings of union literature, and because of similar working conditions the union will probably use much of the same material for both campaigns.

The two new drives are part of the IUE District 7's all-out plan to organize white collar workers in the area. In addition to their September victory at Chrysler Air Temp, the union was previously successful in organizing a unit of technical employees at Leland Electric Company.

Study Group Drafts Revised Bill on Department of Science

Senator Hubert H. Humphrey, chairman of the Subcommittee on Reorganization and International Organizations, has released an outline of additional legislative proposals prepared by the Committee staff to bring about better coordination of Federal civilian science programs. One of the proposals is designed to overcome the opposition that has developed from numerous sources to the proposed creation of a department of science and technology. Senator Humphrey was the chief sponsor of legislation in the last Congress to establish such a department.

The draft bill prepared by the staff proposes that the Department of Health, Education and Welfare be reorganized to include certain civilian science activities of the Government including the Coast and Geodetic Survey, the Bureau of Standards, the Commerce Department's Office of Technical Services and the Science Information Exchange in the Smithsonian Institution.

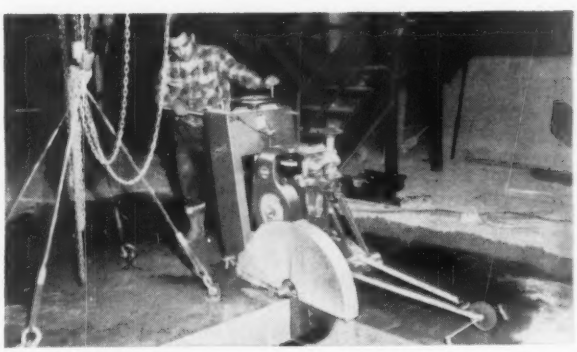
The name of the Department would be changed to the Department of Health, Education and Technology, or the Department of Science, Health and Education. All functions of the Social Security Administration currently under HEW would be transferred to the Department of Labor, changing its name to the Department of Labor and Public Welfare. The proposed change would not affect HEW programs in the medical sciences and education.

The staff has also redrafted proposed legislation to establish a Hoover type Commission to study the feasibility of a department of science and technology. Legislation similar to the staff draft was introduced in the closing days of the 86th Congress by Senator Humphrey to meet objections to an earlier study commission proposal.

The study commission idea grew out of testimony presented before the Committee in the 86th Congress from witnesses who recommended that before any specific program could be developed and appropriate action taken concerning a proposed cabinet-level science department, it would be necessary to have an extensive study made by persons who were qualified in these fields. The revised study commission draft bill would require that six of the twelve-member commission be private citizens "who are eminent in one or more fields of science."

Careers in Government for Engineers Seen Improving

Civil Service Commission Chairman, John W. Macy, Jr. said recently that opportunities in the Federal service for college-trained people are "better than ever" this year. In a "Federal Career Outlook Letter" being sent to college of-



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ficials throughout the country, Macy said that agencies are recruiting for more than 3000 engineering positions in almost every specialty for work in programs ranging from space and missile projects to reclamation and mine-safety operations.

New engineers with bachelor's degrees generally start at $5335 a year, but those who qualify as "superior" start at $6345. Engineers with a master's degree or two years of study beyond the bachelor's level are offered $6435 to start. Applicants who can qualify for research and development jobs and who have a master's degree with two years of study beyond the bachelor's level begin at $7560, while those with doctor's degrees who qualify as "superior" enter at $8955 a year.

Federal agencies are recruiting for approximately 400 new graduates in physics, 250 in chemistry, 300 in mathematics and 350 in other physical science specialties. Starting salaries and qualifications are the same as those for engineering positions.

Technical Competence Pay Considered by Pentagon

Technical competence pay for engineering and scientific officers is under discussion at the Pentagon as one of several steps which are needed to improve career retention rates in the Armed Forces. The proposals were revealed in military budget testimony recently released by the House Military Appropriations Subcommittee. Maj. Gen. E. S. Ligon, director of Air Force Personnel Planning, submitted the list of proposed actions.

Following is General Ligon's statement with respect to technical competence pay: "This proposal would provide additional pay for scientific and engineering officer personnel. It is needed in order to offset the critical shortage of military scientists and engineers. Technical competence pay would reduce scientific and engineering officer turnover, increase S & E competence, provide continuous salary and career incentives, provide individual recognition, and make the service career more attractive. The plan would include all scientific and engineering officer personnel. It would be based on their level of education and on proportionate amounts (scaled in accordance with active Federal military service) of up to $100 per month for personnel educated to the baccalaureate level, up to $200 for those at the master's level, and a maximum of $300 for those at the doctoral level."

Meetings of Note

American Nuclear Society—Annual Meeting, June 4-8, Penn-Sheraton Hotel, Pittsburgh, Pennsylvania.

Society of Automotive Engineers—Summer Meeting, June 4-9, Chase-Park Plaza Hotel, St. Louis, Missouri.

American Society of Mechanical Engineers—Summer Annual Meeting, June 11-14, Statler Hilton Hotel, Los Angeles, California.

Air Pollution Control Association—Annual Meeting, June 12-16, New York, New York.

American Society of Agricultural Engineers — Annual Convention, June 23-24, Governor House, Jefferson City, Missouri.

American Society for Testing Materials—Annual Meeting, June 25-30, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

American Society for Engineering Education—Annual Meeting, June 26-30, University of Kentucky, Lexington, Kentucky.

National Association of Power Engineers—National Convention, July 17-21, Sheraton-Gibson Hotel, Cincinnati, Ohio.

Montana SPE Protests State-Union Contracts

The Montana Society of Engineers has called on the State Highway Commission to cancel a collective bargaining contract with the American Federation of State, County and Municipal Employees, AFL-CIO, covering engineering and office personnel.

The agreement affects some 100 engineering positions including about 25 registered P.E.'s. It would require union membership as a condition of employment except for those employees with ten or more years seniority. The agreement does not apply to employees at or above the division engineer level, or to Helena Headquarters personnel. The contract was signed before the engineers had been given a chance to express their wishes regarding union representation and membership.

In protesting this action, the Montana Society has also questioned the legal right of the Highway Commission to enter into a labor union contract requiring compulsory membership in the absence of special statutory authority. In this connection the Society had previously been successful in killing a proposal before the State Legislature which would have empowered a state department or agency to negotiate and sign collective bargaining contracts with a labor union.

The contract with the AFSCME recognizes the union as exclusive and sole bargaining agent over such matters as salaries, grievances, overtime and working conditions. The original pact will be in force for two years, and can be renewed for one year periods thereafter.

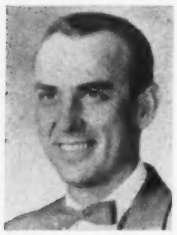
The Society told the Highway Commission that neither the State of Montana nor any of its departments is subject to the Taft-Hartley Act and is therefore not required to recognize or bargain with any union, or to enter into any union contract. Further, the Society maintained that as a general rule an employer is not required to bargain with any union which has not given satisfactory proof that it represents a majority of the employees.

Rep. Brooks to Investigate "Sidebar" Organizations

Representative Overton Brooks, chairman of the House Committee on Science and Astronautics, has announced an investigation of so-called "sidebar" organizations, set up to provide engineering and scientific services to military and space agencies. These nonprofit corporations are supported almost exclusively by Federal funds and can pay their employees much higher rates than are received by Civil Service engineers and scientists, even though they may be working side-by-side on similar tasks. Both groups are being paid by the Government—one directly and the other indirectly. Chairman Brooks has characterized the system as "obviously a means of getting around Civil Service pay scales." He quickly added, however, that "I am not passing judgment upon the practice, but I question whether this is the solution to the problem of obtaining skilled personnel for the Government."

Strictly Business

Personalities . . . **Reed A. Troxel** has recently joined the partnership of **Stuart H. Snyder** in the Syracuse Consulting Engineering Office . . . **Joseph Cohen** joining a nucleus of the newly organized Electron Beam Section of **Hamilton Standard Division** of **United Aircraft** . . . **C. W. Schemm,** principal electrical engineer of **Sverdrup and Parcel and Associates, Inc.,** St. Louis, Mo., has been appointed by Missouri Governor Dalton to serve on the Action Committee of the Governor's Traffic Safety Conference . . . **Robert S. Calkins** has formed his own civil engineering service in Lincoln, Neb. . . . Directors of **Jamaica Public Service Limited** recently elected **Robert H. Willis** as president . . . Appointment of **Glenwood L. Alsobrook** as vice president and treasurer of **Industrial Electronic Engineers, Inc.,** has been announced . . . **S. D. Larks** will join **Marquette University's** electrical Engineering faculty in September to organize a new program in bioelectrical phenomena and biomedical engineering . . . The appointment of **Howard L. Phillips** as manager—International Division, has been announced by the **Nordberg Manufacturing Co.** of Milwaukee, Wis. . . . **David E. Thorn** has been appointed materials engineer, Engineering & Research Division **Motec Industries, Inc.,** Hopkins, Minn.



Mr. Troxel

The **Air Force** has announced the promotion of **Lt. Col. James H. Voyles, Jr.,** Ballistic Systems Division, Air Force Systems Command, to the temporary grade of colonel . . . **Fitz L. Sargeant** has been elected vice president of **Reynolds Aluminum Service Corporation . . . Allegheny Ludlum Steel Corporation** recently announced the appointment of **W. R. Breeler** as president of Allegheny Ludlum International, S.A., with headquarters in Geneva, Switzerland . . . **Keith T. Middleton** was elected president of **The Fafnir Bearing Company,** New Britain, Conn. . . . Election of **Frederick J. Seufert** as president of **U. S. Science Corporation,** Los Angeles, was announced recently . . . **Dr. Robert W. Van Houten,** president of the Newark College of Engineering, has been elected president of the **American Society for Engineering Education** . . . Election of **Curtis E. Johnson** as a director of **Hathaway Instruments, Inc.,** was announced recently . . . Stockholders of **Albert Kahn Associated Architects and Engineers, Inc.,** recently elected **George H. Miehls** as chairman and treasurer, and **Paul G. Fleck** as vice president and director . . . GPL Division of **General Precision, Inc.,** has announced the appointment of **Dr. Walter R. Hedeman** as coordinator of advanced development, Engineering Division.

Lt. Col. Voyles, Jr.

A. E. Busch has been elected president of **Keuffel & Esser Co.** to replace retiring **C. W. Keuffel** . . . **Hazeltine Corporation** has elected **R. L. Beam** as executive vice president . . . Stockholders of **Crucible Steel Company of America** recently elected **George S. Craft** to the board of directors . . . **Robb W. James,** general manager, **Union Switch & Signal—Division** of **Westinghouse Air Brake Co.,** has been elected vice president of the parent company . . . **Dr. Bernd Ross** has joined the Semiconductor Division of **Hoffman Electronics Corporation** as manager of the solar development section and assistant technical director . . . **Marvin Lane** has been awarded the title of president of the **Graver Water Co.,** a division of **Union Tank Car Company . . . J. T. Cataldo,** corporate vice president of **International Rectifier Corporation,** has also been appointed executive vice president and general manager of the company's wholly owned subsidiary **Dallons Laboratories, Inc., . . . R. G. Halvorson,** executive vice president, Hamilton Manufacturing Co., Two Rivers, Wis., has been elected president of the **Scientific Apparatus Makers Association.**

Mr. Busch

Dictograph Products, Inc. has appointed **Leon G. Barry** chief engineer . . . **Richard T. Kropf** has been elected president and chief administrative officer of **Belding Heminway Company Inc.** of New York City . . . **Herman J. Shea** has joined the staff of consultants and engineers of the **New England Survey Service, Inc.,** Boston . . . **John H. Humphrey** has been appointed executive vice president of **Dashew Business Machines, Inc.** of Los Angeles . . . The appointment of **Roy B. Totten** as sales engineer of thermoelectric refrigeration products was announced by the **Norge Division** of **Borg-Warner Corp.** . . . **Laszlo J. Bonis** has been appointed executive vice president of **Ilikon Corporation** by the board of directors . . . **A. C. Brodie** has been named assistant to the president of **Badger Manufacturing Company,** Cambridge, Mass. . . . **John C. Monday** has been elected vice president and general manager of the **Hapco Division** of **Hubbard and Company** . . . **Girard L. Bovie** has been named to the new position of assistant director of engineering and assistant chief engineer for **General Mills** . . . **Samuel G. Richardson** has been appointed general manager of **Austin-Anderson** (Australia) **Pty. Ltd.,** the newly formed Australian company jointly owned by Austin and A. J. Anderson Pty. Ltd. of North Sydney, Australia.

Mr. Barry

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What's Wrong With College Recruiting?

The three-sided picture: On one hand, the college placement director with loyalties divided in three directions — to the college, to the graduate, to industry; on the other hand, the recruiter with a firm to sell and a quota to meet; and in the middle, the graduate, unsure of his status, unsure of his goals, who is given too little time to make his important decision.

By
FRED HAMLIN
AMERICAN ENGINEER *Staff Writer*

PROBABLY the most succinct summing up of the present recruiting system for college engineer graduates is offered by an industry recruiter in the Washington area: "Sure it's a rat race, but how do you improve on it? I can't imagine any basic improvement that could be made."

In two short sentences there is expressed here the frustration, the confusion, the acceptance and the resignation to a system that is trying to please all of the people all of the time, and meeting with the results that might be expected by anyone who knows the rest of the Abe Lincoln saying.

That recruiters, graduates and college placement officers are making the best of a less-than-satisfactory system is undeniably the case. But it is equally true that considerable strides have been made to straighten out the worst problems in the area of college recruiting, and that patience concentration and cooperation can do much to ease the problems that remain.

If someone were to sit down and try to devise a system of hiring that was as unrealistic as possible, it would probably look a good bit like the college recruiting system that is now in use. For instance: The basic ingredients are a college graduate who has had minimum if any business experience, a recruiter who may be seeing as many as twenty similar graduates the same day, and a college placement officer who has varying but unquestionable responsibilities to the recruiter, the graduate and the school for which he happens to be working. The interview is likely to last about twenty minutes, and at the end of this time the recruiter has to decide if his company is interested in the graduate, the graduate has to decide if he's interested in the company, and in less than enough time for a cup of coffee, they may both be starting another interview. Less than desirable? It could hardly be considered otherwise. Perhaps the most flattering comment that can be made about the people involved is that they can make such a system work to the general satisfaction of company, college and graduate.

Fairly plainly, the law which has controlled—or pushed out of control—the college recruiting system is the old reliable law of supply and demand. Certainly it is this law which dictates a $13,500 starting salary for a 22-year-old engineer with a degree in com-

puter technology. And it is certainly this law that, under more general and normal circumstances, holds the salaries a given graduate will be offered "within $4 or $5 of each other" according to one recruiter. The booming demands of the past few years for engineers has certainly tended to outrun the supply and perhaps this is one of the reasons why college recruiting has come to be considered a problem at all. But as surely as the law of supply and demand has forced this particular system out of focus at times, it can be used as something like a predictable basis for the future.

In minor ways, many people have begun to realize this. In one case, a west coast manufacturer was recruiting in the East and offering not only salaries a cut above the average, but also reimbursement for all resettlement costs for those it hired. The reason for the difference was that the company needed a lot of engineers for a relatively short time, and needed them badly enough to improve its competitive position on the market. Needless to say, when the engineers were no longer needed, resettlement costs weren't paid for those who wanted to return to the East.

One result of the foregoing instance, incidentally, was that at one school where the company was recruiting, all of the graduates signing up for interviews were given a list of rather pointed questions to ask of the recruiter. The net result was that this particular company hasn't been back on campus since. This touches on one of the tenderest points in the college recruiting picture: Just where does the placement officer fit in the picture—is he a traffic cop, a sort of a white slaver for technical personnel, or simply a representative of the university who acts only as a go-between for both graduate and industry. The answer is probably a bit of all three, and how much of each is involved in a final answer is pretty much a matter of whom you ask.

As defined by Don Armiger, assistant employment supervisor with Vitro Laboratories, the college placement officer's job is to "let the troops know we're coming and then stand back out of the way." One disgruntled recruiter summed it up in the *Wall Street Journal* this way: "Their biggest service should be guiding and counseling students. Instead, they are spending their time playing little tin gods—making us walk what they consider the straight and narrow. Most of them do nothing at all to screen the people signing up for interviews. I'm interested only in talking to engineers, but I've ended up with everything from archeologists to music majors."

On the other side of the fence, there is some feeling that at least part of the placement officer's job should be just a bit more than simply standing back out of the way. Take the instance of one missile manufacturer whose recruiter was singing the praises of the "truly professional atmosphere" at his company, where all that mattered was getting the job done. Lunch hours were at the discretion of the engineer, and no one was concerned about anything beyond the quality of the work turned out. Not mentioned in the presentation were the time-clocks used in the company's engineering department. Comments a recruiter from another company who knew of this instance, "It was probably more a matter of excess enthusiasm than lack of ethics." Perhaps this is too thin a line to draw, but whether or not it is a matter of ethics or enthusiasm, there would seem to be some justification for at least a buffer between the graduate who may not know just what questions to ask, and the recruiter who quite understandably may not offer every item and detail that could possibly pertain in a given case.

Recruiters complain that because placement directors do nothing to screen applicants for interviews, they end up talking to anyone from archeologists to music majors.

Basically the problem is one of a gap between business and professional ethics, as summed up by Dean Martin Mason of the George Washington University School of Engineering. Comments Dean Mason, "A recruiter will seldom explain that these boys are being paid for what they can do *now*. Our attitude is that graduates should know this, and if they are particularly specialized, hold out for as much as they can get. There is very definitely a double standard. The recruiters will come to me and ask 'What do you know about Joe Doaks,' but they seem to resent it if a student makes similar inquiries. Certainly we don't ask the companies to run themselves down, but we do insist that our responsibility to our students permits and requires that we advise them on company practices."

This does not mean that the student is immature. To the contrary, there seems to be general agreement that the engineering graduate is steady, reasonable and fairly sure of what he wants. But finding the wisest way of getting what he wants may be another matter. Taking one example, Dean Mason points out that many recruiters complain that students are too security conscious. "I feel," he says, "that this may go back to the fact that too many companies are not really hiring physicists or engineers as professionals. They simply want intellectual technicians to fill slots for the duration of a contract. If the contract goes, the job goes. The word gets back to the campus, and all of a sudden job security means a lot to the graduate. A college graduate is a young men, and he really doesn't want much in the way of security—a few years, a year, even a matter of months and a reliable appraisal of the future prospects." But there seems to be a basic misunderstand-

ing here between the recruiter and the graduate."

At least a part of the misunderstanding would seem to lie in the attitudes of the young engineers as opposed to what the various industries want. It seems unlikely, if he has had an indoctrination on professionalism at all, that the college graduate is going to willingly consider himself an "intellectual technician." He is more likely to be interested in finding a fairly stable position in which he will be able to grow both technically and professionally. On the other hand, industry has certain problems of its own. In the up-and-down situations that are a part of today's technical work, industry can never know just exactly what it is going to need for any extended period of time. The result is that a given company may be forced into hiring many engineers in a hurry, either to fulfill a defense type contract, or perhaps, quite legitimately, to exploit a technical breakthrough that it has achieved. If the positions are apparently irreconcilable, it is perhaps because not much effort seems to have been expended to get them together.

From the academic standpoint, Dean Mason offers this opinion: "Industry and the engineering schools simply aren't coordinated on their needs. I can't help feeling that much of the confusion in this area today could be avoided in the future if industry would try to let us know what they will be needing in the future. I realize that it's impossible to be really specific about this, but I also find it hard to believe that industries don't know generally where they're headed over the next five years. Right now, much of the recruiting that's done is a purely random process, and inevitably there must be stop-gapping and other measures to allow for mistakes."

It would appear to be a situation that relates to the same law of supply and demand that seems so basic. And unquestionably, if the universities and engineering colleges knew exactly what industry would need five years from now, it could meet the demand and there would certainly be a more stable situation. But it is perhaps

The "truly professional atmosphere" at one company included a time clock in the engineering department, which the recruiter forgot to mention.

significant that Dean Mason points out, "We had people in here this year looking for engineers in a branch of science that we barely a gleam in a physicist's eye five years ago. Obviously, we can't react that fast."

Without giving away any trade secrets, it would seem logical that some time and effort be put into this facet of the situation. The aim would be to create a more stable over-all situation for both recruiter and graduate, and it would probably be welcome if it accomplished nothing else. Perhaps more important, it would tend to place the graduate engineer in a more professional position in his negotiations with companies and start him off on a more career-oriented basis than is now the case.

Perhaps a logical point of departure might be the first of Ten Steps to a Professional Engineer-Management Relationship in Industry, published by the Engineers in Industry Committee of the National Society of Professional Engineers: "Recruiting policies should reflect a professional approach. Advertisements should be forthright and factual, and should avoid exaggerations. Interviews should give a complete picture of company operations and policies, and a full description of individual duties and responsibilities, professional working conditions, compensation, and opportunities for professional advancement."

Taking only one point in this, it is probably true that the majority of recruiting literature that is used in connection with colleges could be a good bit more mature than it is presently. Perhaps with this in mind, Vitro Laboratories has confined their brochure to a single sheet of paper which is characterized by Don Armiger as "conservative. It costs us only about a tenth of a cent a copy, and we've gotten a good bit of applause for it on some of the campuses. These people are mature. They aren't swayed by a lot of tinsel, they simply want the facts."

GW's Dean Mason adds this point: "Contrast college brochures with the approach used on the older engineers. In the latter case, there is definitely an appeal to the man as a professional. The selling point isn't a specific project, or salary, or fringe benefits; but rather hinges on a company's over-all technical position and accomplishment. And there's a lot less emphasis on the golf and swimming facilities."

What it boils down to is the difference between an appeal to the emotions and an appeal to professional challenge. Or the difference between salary and sunshine on the one hand, and on the other security and professional growth. Perhaps one result of the former approach is characterized by the comment of one young electrical engineer who has had three jobs in the three years since he graduated: "My security," he shrugs, "is that I can get another job, and one that pays well." If this appears somewhat cynical, it is equally apparent that the young engineer is faced with few alternatives.

It is difficult to say how much of the foregoing is exception and how much is standard procedure. Comments one recruiter, "It's like anything else that is this big. There are bound to be a few sour apples in the barrel." And if there are people in the recruiting business whose ethics are less than admirable, it seems fairly clear that the people dealing with them on a year-to-year basis realize this, and treat them accordingly. But it should be added that the graduate does *not* deal with them on a year-to-year basis. This brings up again the question of some sort of pro-

tection, some sort of a buffer zone between engineer and recruiter.

Perhaps the most noteworthy attempt at this is that of the College Placement Council, a central office for a number of regional associations of placement officers at various colleges. CPC's approach was to sit down with industry and say, in effect, this is a great game, but it needs some ground rules. The result was a code of recommended practices and procedures for student, recruiter and college, which has since been reviewed, approved, modified and endorsed by ASEE and ECPD. Robert F. Herrick, executive director of CPC, points out that "it should be made clear that this document is a statement of principles and practices and not a code of ethics even though the latter phrase is commonly used to cover the waterfront. The important distinction in our view is that a code presumes an enforced set of ethical laws, while a statement of principles and practices establishes accepted procedures as a guide to voluntary compliance by practitioners in the field."

These principles were agreed upon and published some four years ago, and, again quoting Herrick, "Compliance . . . from our point of view, has been gratifying." Basically, the principles are simply a codification of common sense. There are no rigid restrictions imposed on anyone. One recruiter's comment offers a fair summing up: "I've never really studied it, but I'm sure that anyone with a normal, reasonable sense of ethics is not going to violate it."

WHEN talking to those who are familiar with the "recruiting season," there is somehow a hint of red coats and hounds and horns in what's said. Extending roughly from October to April or early May, the pressures seem to be heavy on just about all concerned. Because most recruiters work against a quota, they are clearly pressed right up until they've bagged the limit; the student is out for a job, and is pressured to sort out the mass of interviews, the facts, the offers and make his bid. And for the student, this can often be complicated by the knowledge that while he's making up his mind, the quota in which he wants to fall may be filled, and the offer withdrawn. At best, the recruiter can only estimate on this. Comments one, "If I could balance out all of the factors that are involved in knowing how many offers will be accepted, and when to stop making offers, I'd get out of the recruiting business and go into the stock market. It's only a little bit more complex, and there's more money to be made."

Next to filling the quota, the recruiter's most important job seems to be avoiding the need to withdraw offers. One large manufacturer, for instance, selects a list of 500 engineers with a need for 100. The 500 are ranked in five groups, in order of desirability. The first group is made job offers and given two weeks to decide. Those who accept are hired, and if the quota isn't filled, the same two weeks option is extended to the second group, and so on until the quota is full. On the one hand, the company always knows within two weeks time just where it stands. On the other hand, if the graduate has even interviewed with another company, or wants more interviews, or is reluctant to make up his mind on a number of offers, his arm is merrily twisted practically off. And this is only underlined by the length of the recruiting season.

Admitted one student who has had three jobs in one year, "My security lies in always being able to find a better job."

At the other extreme, there are those companies who have the leisure and luxury that comes with the knowledge that they (a) don't need too many engineers, (b) have enough money and reputation behind them to be highly competitive, and (c) have no need to settle for anything less than the very best. Obviously, they have only to make a reasonable number of bids and sit back and wait.

As seems clear in most of the recruiting picture, the man in the middle between the two extremes is the graduate. This is certainly not to say that the graduate has everything working against him. Certainly, in today's labor market, the engineering graduate is one hot commodity, and is taking care of himself very nicely.

But to draw a rather thin line, the engineering graduate may not be in his good position for the best reasons. If, as some contend, he is being used simply as an intellectual technician, if he is ultimately subject only to the law of supply and demand, if he is being forced into the position of disregarding professionalism in favor of expediency, then it certainly seems to follow that his position is at best on shaky foundations, and at worst untenable.

With the adoption of a statement of procedures and principles, and with the realization on just about everybody's part that there could be no repeats of what Robert Herrick labels "the frenetic recruiting season of 1956-57," much progress has been made to create the best out of a clumsy and hectic situation. Unquestionably, much of the termite damage has been repaired, but there would seem to be a question unanswered on whether the termites themselves have been taken care of.

It is perhaps time that industry, the colleges, and perhaps even the engineering profession itself, sat down and took a long look at college recruiting. Certainly any basic improvement is going to take time, considerable patience, and an excess of cooperation. But the results to be gained—in terms of more highly professional young engineers, a more stable and satisfied workforce for industry, and a much more realistic approach to the problem—would seem to be well worth the effort involved.—**End.**

FROM WASHINGTON

BY
MILTON F. LUNCH,
N.S.P.E.'s Legislative Counsel

Studies of Strikes ►

It is generally conceded that the common-situs picketing bills are dead for this year. Most such observations are coupled with references to the cleavage between the building trades unions and the industrial unions within the AFL-CIO. The industrial unions have taken the position that if the restrictions on secondary boycotts are to be relaxed, the same benefits should be extended to them. There is little doubt that any such general approach would meet with the strongest kind of opposition. An additional factor currently in the news is the disclosure by Senator McClellan's Permanent Subcommittee on Investigations of extensive "featherbedding" and "wildcat" strikes by the building trades unions in the construction of missile base sites, resulting in excessive costs and serious delays in the program. The Administration is reported to be concerned about the situation and Secretary of Labor Goldberg is undertaking to develop cooperative arrangements to end such practices. Senator McClellan has indicated that he may introduce legislation to prohibit strikes in defense work. The missile base construction scandal has virtually assured that Congress will not be in the mood to grant special privileges to the building trades unions.

◄ Uniting the Unions

Meanwhile, the construction industry may ponder the implications of the possibility that the traditional relationship with separate craft unions may be replaced by a centralized industrial type union structure. This has been talked about behind the scenes for some time, particularly during periods of shutdowns due to jurisdictional disputes. Former Trust-Buster Thurman W. Arnold represented the National Small Business Men's Association of Washington at the common-situs hearings and boldly stated that his group thought the time had come to replace the 20-odd separate building trades unions with a single union for all aspects of building work, a la the pattern in the basic industries (steel, coal, automobiles, etc.). Arnold argued that if the multiple union approach prevailed in the auto industry "only the very rich could afford a car." It is true, he added, that one union has the power to close down the entire operations of an auto manufacturer, "but in doing so it is bargaining for all the workers, not for a particular group. No single group in the automobile industry has the power to put their fellow employees in the industry out of work in order to enforce demands, the benefits of which these fellow workers do not share." He said the present system results in very high wages and low take-home pay for construction workers and has inflated the prices of houses beyond the means of the middle-income group. District 50, the catch-all union of the United Mine Workers, is attempting to organize construction workers into one union, and Arnold predicted that if the union succeeded, "It may mean the dawn of mass production in low cost housing." But if the common-situs bill is passed, he added, "the present obsolete type of service in the building industry will be perpetuated indefinitely."

Peking's Problems ►

A report on Communist Chinese professional manpower and education, released by the National Science Foundation, sees that country's scientific effort geared to meet immediate technological demands, its education undergoing rapid change and expansion, and its development as a major industrial power handicapped by its population problem. NSF Director Alan T. Waterman said the report was "a pioneering effort in a field made difficult by limited availability of reliable source material. Communist China's scientific and technological capabilities cannot be properly evaluated without detailed assessment and full understanding of its professional manpower and education. I hope this report will encourage further study of this very important field."

The number of highly qualified personnel capable of advanced scientific research in China is small, according to the study, with major research emphasis on immediate application. While the report regards Chinese education as impressive in terms of numbers and statistical indexes, standards of quality are held to be debased by the excessive proliferation of faculties and facilities, and by ordering ever increasing numbers of students into programs combining study, labor, and political indoctrination.

◄ Manpower Meeting

In 1960 the House Committee on Science and Astronautics inaugurated a rather unique and intriguing procedure whereby engineering and scientific leaders were brought together to informally discuss the status and future of engineering and scientific progress in the United States. The third such panel meeting was recently concluded and the text of the commentaries has now been published. Copies may be obtained from the Committee. Chairman Overton Brooks set the tone of the discussion with his comment: "The meteoric expansion of our technological activities within the last decades has been accompanied by many problems which are not of a strictly scientific character, and yet which directly affect the quality and the rate of our technical progress. When the industrial revolution came of age, it multiplied its benefits through highly automated mass production. Increasing the research output of our scientists and engineers, so immediate to our National purpose, is unfortunately not so simple as reducing the complex to the routine."

Some selected comments from members of the panel follow.

Comments From the Conference ►

Martin Goland, president, Southwest Research Institute and a noted mechanical engineer: "I would say that we should develop an expanded system of institute task forces which relieve the university of the burden of artificially accelerating specific scientific areas. They are presently assuming this responsibility, and I believe the university representatives here will agree that this practice is neither in the best interests of the university nor the Government which sponsors the work. My thought is that this responsibility be removed in some measure from the universities, and that it be placed where it belongs, on the shoulders of a full time research team whose objective is to accomplish this stimulation."

Sverre Petterrsen, chairman, department of meteorology, University of Chicago: "I think the main problem is really to produce more scientific manpower, to produce more young talent than we are now producing; my paper deals with this problem. I maintain that in our hunt to produce new knowledge, we are probably forgetting the other side of the picture, namely, that we must produce new knowledge and new talent at the same time. I am afraid that in certain areas of science we have been living above our resources as far as talent is concerned."

By ROGER E. GOODWIN, P.E., R.A.,
Westwood, N. J.

let's have ARCHINEERS

THE current popularity of architect-engineer firms and the current friction in the courts between these two respected professions highlight the need for a new appraisal of where we are going.

The writer is a civil engineer by basic training and is a licensed professional engineer in several states with varied building design and construction experience. He recently completed courses in architecture and has passed the state Board examinations in New Jersey to become certified as a registered architect.

Thus he is squarely in the middle of the current controversy between the architects and engineers and highly sympathetic to *both*. He can calmly observe both sides without favoring or attacking either. From this double viewpoint there emerges what seems to be a satisfactory solution.

It must be considered that the two professions have become so inviolably intermingled in building design that it is difficult to determine where one ends and the other begins.

Certainly many architects have missed the trend of modern thought and materials by staunchly maintaining that space and form are the primary considerations in building construction. The best planned space and aesthetics would be useless without structural stability and properly functioning contents. In a strictly economic sense, the "engineering" materials in a building usually cost more than the "architectural" contents. Indeed, many of the so-called architectural materials such as windows, curtain walls, acoustic systems, etc., are actually designed by engineers and made on machines designed by engineers. Further, most of the actual construction of buildings is performed under the direct control and supervision of engineers.

Considering over-all buildng design, ten fully competent architects will evolve ten different solutions to any given problem, and who is to say which one is "right." Their different backgrounds and experience will give each a different viewpoint as to what constitutes the most satisfactory solution. Probably all ten would strike some compromise between aesthetics, function and cost. By extension of this, however, it is invalid to assume that the engineer's eleventh solution is incorrect because he lacks adequate training in space and aesthetics. Indeed his comprehension of a client's manufacturing procedure, for example, may enable him to design a factory better suited to its usage and his aesthetic "ignorance" would be of little significance.

Military construction, including buildings, is performed under the Corps of Engineers, not Corps of Architects; the Port of New York Authority elected to execute all its complicated construction under the primary direction of engineers, not architects. The engineer can organize, guide and control a design "team" as well or better than an architect.

Conversely, however, the engineer's knowledge of a building's container and contents does not especially qualify him to organize the client's space requirements into an aesthetic and humanized structure. His knowledge of thermodynamics may enable him to comprehend the functioning of the heating and air-conditioning systems

The famous Guggenheim Museum designed by Frank Lloyd Wright, originally trained in an engineering background, is an example of how function and form can be given equal emphasis.

but may leave him bewildered as to how to arrange space into an eye-pleasing whole.

Most state licensing boards and the National Society of Professional Engineers very correctly make no distinction between the various branches of engineering. The way has been well paved by the medical and legal professions who license only doctors and lawyers, not specialties. But this can have serious shortcomings as applied to the building industry. For example, a superior chemical engineer is not likely to have a thorough knowledge of building construction yet his professional engineer license qualifies him to sign plans and specifications. He should, of course, recognize his limitations and act accordingly, but he is not legally required to do so. This kind of thing is, justifiably, one of the architects' primary objections to all engineers being entitled to sign such plans and specifications.

These combined factors strongly indicate that the complexities of modern building construction are such that neither an architectural nor an engineering training yields a satisfactory background for its full comprehension. Both educations leave something to be desired. Accordingly, why not develop men thoroughly grounded in both professions? Such a training is definitely feasible and could probably be achieved in five years. Why not substitute art courses for chemical engineering, thermodynamics for abstract art, etc.? Qualified candidates would have a comprehension and affinity for mathematics, science *and art*. Such prerequisites are not so difficult for schools to find or for students to acquire, and educational training could amplify and develop these attributes. Working experience in these combinations is readily available.

Men with this training and background could be designated as "archineers" or, if preferred, "engitects," and receive separate licensing as such. Practicing engineers and architects with adequate experience in both professions could be granted these licenses under a grandfather clause. Licensees could be enabled to sign both architectural and engineering plans and to join both societies. Their own society could evolve in time since the clients' growing preference for architect-engineer firms indicates a ready acceptance of this broader base.

It could prove to be a happy compromise to the current friction and could lead to the eventual partial merging of the two professions. If, as the signs seem to indicate, there is ready acceptance of this combination, one can envision the gradual alteration of classical architectural training to recognize the realities of the importance of engineering and even, perhaps, eventually graduate only archineers. At the same time, the engineers should recognize that the inherent limitations of their traditional engineering training, particularly in those branches most remote from building construction, do not qualify *all* licensed engineers to design buildings. They should be willing to accept limitations upon what types of plans they may sign. Perhaps the engineers should also modify some allied courses toward "archineering."

It should be mentioned here that a suggested interim compromise to the current legal controversy might be the addition of another part to the engineering state board examination wherein a candidate would be tested in his ability to aesthetically and practically design a building and site. Men passing this portion of the exam as well as the more conventional one could be designated as P.E.B.: professional engineer, building. Legislation could be enacted to permit only P.E.B.'s and architects to sign *building* plans.

It appears self evident that just "getting along professionally" is not going to endure since such matters will not remain stationary. The only method of resolving a strong difference of opinion is through compromise and it is in this spirit that this writer very humbly sets forth these suggestions. If these words can create adequate discussion to attract the serious attention and consideration of the two professions and our educators, his goal will have been achieved.—**End.**

About the Author . . .

Mr. Goodwin

Roger E. Goodwin, P.E., engages in his own engineering and architectural practice in Westwood, New Jersey. He performs diverse civil engineering consulting work as well as commercial and industrial building design. He is a graduate of the University of Michigan with a BCE (CE) degree. Goodwin is a licensed professional engineer in New Jersey, New York, and Pennsylvania and a registered architect in New Jersey. Among the many organizations to which he belongs, he is most active in the Bergen County, New Jersey Society of Professional Engineers.

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White Plains, N.Y.

JETS Award Winner Tours Washington—August, 1960
AE Photo Story

The P.E. at Parke-Davis—September, 1960
By Frederick A. Deiter, P.E.
Superintendent of Plant Engineering
Parke-Davis & Company

Depreciation and the Engineer—A Missed Opportunity?—September, 1960
By Maurice E. Peloubet, C.P.A.
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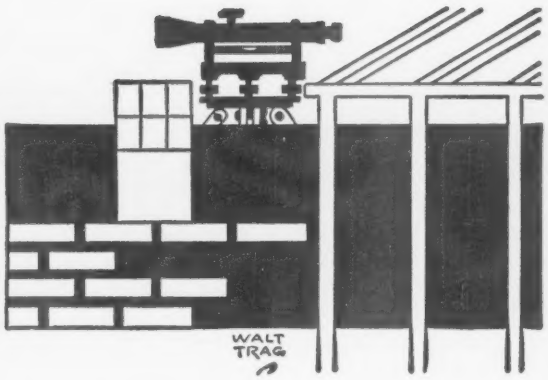
Professional Profiles



John W. Cramer, P.E., of Lincoln, Nebraska, who began his civil engineering career at the age of fourteen, now is senior partner in his own firm.

THERE are probably not too many men in the engineering profession who, at the age of 47, can claim 33 years of direct or indirect engineering experience. But for John W. Cramer, P.E., senior partner of the firm of Fulton & Cramer in Lincoln, Nebraska, this is precisely the case.

At the age of 14, Cramer volunteered for his first job having to do with civil engineering—carrying water for construction teams then working for his father. It is perhaps typical of Cramer's later performance that in just three years he had moved up through the ranks to be the foreman of one of the carpenter gangs.

At any rate, he must have liked the type of work involved, because John Cramer has been doing it ever since. And he must have been sure of what he wanted early in life, because he turned down an offer to attend West Point in 1933 to continue his career in the engineering profession.

Since the first series of promotions that got him from water boy to foreman of a carpenter gang, Cramer has followed the precedent of a rapid rise to the top in whatever organization he was working for. As a student at the University of Nebraska, he received his B.S. in civil engineering "with distinction." After graduation he went to work for Lockheed Aircraft Corporation as a junior detail draftsman, and wound up as the youngest senior fuselage design engineer in the company, with final responsibility for every fuselage design produced by the plant in which he was working. As sort of an interlude Cramer took a job with his future partner, Robert Fulton, as deputy chief engineer for Davis & Wilson Architects and Engineers for the construction of a $15-million Air Corps facility at Buckley Field in Colorado.

In 1944, Cramer went to work as chief engineer for the Chemold Company in Glendale, California. A year later he went into partnership with Robert Fulton doing general municipal consulting work including investigations, reports, design and supervision of construction for water and sewage works, paving, gas systems, electric generation and distribution.

As well as his membership in NSPE, and the Nebraska Society, Cramer belongs to the American Society of Civil Engineers, American Society of Mechanical Engineers, Nebraska Engineering Society and the American Water Works Association. Currently president of AWWA, Cramer is also president of the Nebraska Section of ASCE, and a former president of the Nebraska Engineering Society. He is registered in Nebraska, South Dakota, Colorado, Idaho, Iowa, Missouri and Kansas.

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One of many industries taking advantage of the resources in the South is this new preparation plant at Price, Kentucky, where high volatile coking coal is processed for the Inland Steel Company to increase the blast furnace and open hearth output at Inland's Indiana Harbor Works.

FOR reasons that make considerable more business sense than the Civil War Centennial, there is a growing number of people who are turning respectful eyes south of the Mason-Dixon line.

Although they probably couldn't tell who commanded the Army of the Transmississippi in 1863, these Dixie-philes are regarding the South with a keen eye for profits and opportunity. The reason for this was neatly summed up by Gov. Price Daniel of Texas, in a recent speech: "As I see the South for next 70 years, I would not advise any young person to leave it, because it is not only possible but it is also probable, that this next century will belong to the South . . . Industry is coming South . . . There is really no other place to go."

Unlike the one that occurred a century ago, this "invasion" is receiving encouragement and active support. Industrialization is—compared to New England, for instance—a relatively new aspect of the economy in the South, and this points to a pair of very worthwhile items for consideration. First, because industry is relatively new, it is probably safe to say that it will offer a pattern of growth more rapid than other areas where industry is more firmly entrenched. Second, and more important in a number of respects, the South has much in the way of development to accomplish. Resources that simply haven't been needed in the past will have to be imported, developed or otherwise created, to meet the needs of an industrializing economy.

Among the resources that will have to be found soonest and in greatest quantity is manpower. Not labor, for this is one area in which the South finds itself fairly well prepared, but skilled manpower—engineers, scientists, technicians and all of the other vital skills that are needed to support successful industry.

What will this mean for the engineering profession? AE wanted to know, and canvassed a ten-state area in the Southeast. Civic and business leaders were contacted, along with leading engineers and officers of the state societies of National Society of Professional Engineers. The aim was to find out what opportunities there would be for the engineer in the future of the South. The results: While most of the states surveyed said they had an adequate supply of engineers for the present, almost without exception, they had at least one eye on future industrialization and foresaw a growing need for engineers and other skilled manpower. The states surveyed: North and South Carolina, Tennessee, Georgia, Florida, Alabama, Louisiana, Mississippi, Arkansas and Kentucky.

Interesting is the amount of technological industrialization that has taken place already in these states. Cape Canaveral is the space capital of the world; Lockheed Aircraft Co.'s Marietta, Georgia, plant is the world's largest aircraft assembly plant under one roof; in 1959, Kentucky boasted over $50-million invested in new plans and plant expansions; Douglas Aircraft Co. is building missiles in Charlotte, North Carolina; a rundown of the major industries in Mississippi must include such manufacturing stalwarts as American Bosch Arma Corporation, U. S. Gypsum Co., Armstrong Cork Co., General Electric Co., Johns-Manville Corp. and Borden Foods Co.; and there are few people in the world who have never heard of the once obscure Alabama town of Huntsville.

"Take a look at *industrial* Mississippi—The cotton fields are still here . . . so are the ante bellum mansions and traditional Southern hospitality, but today the spotlight is on *industrial* Mississippi." So reads a brochure published by the Mississippi Valley Gas Company. This is perhaps typical of other states in the southeast, as is the following opinion, expressed by Fred J. Guice, P.E., secretary-treasurer of the Mississippi Society of Professional Engineers: "The State of Mississippi at the present time seems to have an adequate supply of engineering talent. This situa-

neers the South Says:

"Y'ALL COME"

uthern hospitality has become something more than a cliché as far as engineer is concerned. Industrialization is coming to the South more idly than many people realize, and with it there will be a growing need engineers. Although many of the states in Dixie now have as many engi-rs as they need, the future may change this, and the engineer with an for opportunity would do well to look to the South.

tion could change, however, with extremely fast industrialization, should that occur. The types of engineering work in the state cover practically every field of engineering endeavor . . . civil, electrical, mechanical, aeronautical. . . . The State of Mississippi can offer to an engineer who may be considering relocation such things as ideal working conditions, promise of advancement, ideal and reasonable living conditions far from the stress and strain of more active areas of the United States, adequate recreational facilities including lakes for boating, fishing and hunting. . . .

"Mississippi is also encouraging industrial development because of favorable manpower conditions and available capital, and this work is being pushed by such companies as the I. C. Railroad, Mississippi Valley Gas Company, Mississippi Power and Light Company, various Chambers of Commerce, the Northeast Mississippi Area Development Association and the Mississippi Economic Council."

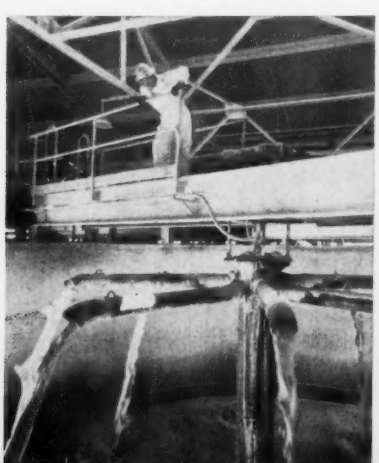
Further aspects of the Mississippi industrial climate were outlined for AE by Carl Black, Jr., assistant general manager of the State's Chamber of Commerce: "In spite of the many changes that are taking place in the State's economy, Mississippi apparently remains an exporter of engineering talent. . . . This does not mean that there are no opportunities in the State. To the contrary, continuing industrialization will require more engineers. Planned industrial parks and industrial sites are being developed throughout the state. . . . Port development is just beginning in the State . . . at the present time a major reservoir is under construction . . . public expenditures for highway construction and maintenance continue to grow. Considerable progress has been made on the Federal Interstate System. Many counties are now considering a special bond program which will accelerate the improvement of county roads."

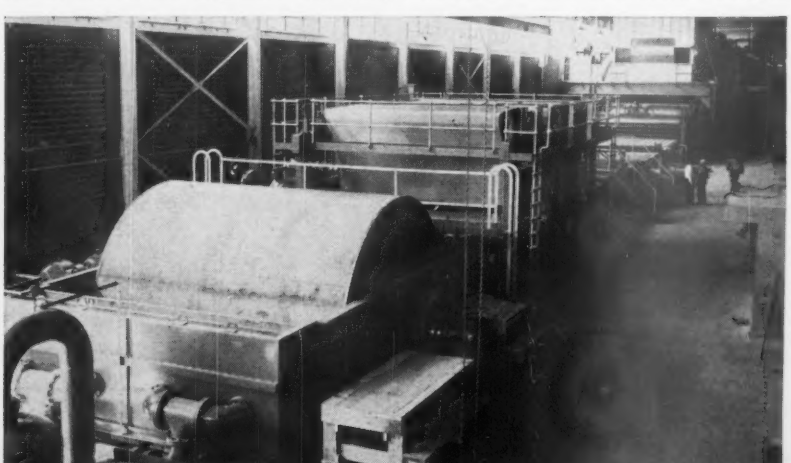
Robert G. Worden is director of research and governmental affairs for the Associated Industries of Kentucky. These are his comments: "Kentucky is among the states of the South and Southeast inviting industrial development. And to back up this invitation, the State, from the governmental and private enterprise aspects, is engaged in many improvement programs." Among these programs, Worden points out, are many that require engineering talent — highways, drainage, sewerage, and water pollution. In another area, Worden continues, there are opportunities for "engineers in various specialties. From a cursory glance, these appear to be in the chemical fields, petrochemicals, distillers and other specialized chemicals."

A LISTING of the industries with new plant developments in the works in Kentucky in 1959 looks like a rundown on American industry itself—food, apparel, lumber, chemicals, rubber and plastic products, fabricated metals, electrical machinery, instruments and primary metals offer a cross section. It would be difficult indeed to point out any of these that had no use for engineering talent.

John Bolen, P.E., is the president

Left is a scene from Ormet Corporation's alumina plant at Burnside, Louisiana. Shown here is one of the plant's 38 precipitators which have a combined capacity of more than 11,000,000 gallons. At right is shown one of the new production lines in the expanded portions of the Armstrong Cork Company's fiberboard mill at Macon, Georgia.





of the Professional Engineers of North Carolina. In the Tarheel State, the situation is much the same as it is in other southern areas. Says Bolen, "The principal industries of our state are textiles, tobacco, and furniture. These are the oldest and therefore the principal ones. However, our state has for some years been engaged in a program of securing new and diversified industries. This effort has been quite successful and we now have a broad diversification, led by the electronics industry. Western Electric Company has three plants in this state where much of the equipment being used in the missile program is made. We also have the plant of Douglas Aircraft Co. in Charlotte where the Nike missiles are being fabricated. . . .

"This effort to further industrialize and broaden the base of classification of industry in our state is going forward with ever increasing vigor. . . . We believe this effort will continue to be fruitful and that engineers who might be considering relocation to our state would find excellent opportunities in the very broad range of fields of practice."

Narrowing the field, AE took a look at the Raleigh, North Carolina, to see just what state development means at local level. In the words of J. R. Drummy, manager of the industrial department of the Raleigh Chamber of Commerce, this is the local picture: "We have branch plants of Westinghouse, Kellogg, Electric Storage Battery and a locally owned plant called Aerotron in the area. All of these plants are heavy employers of engineers. We also have the research facilities of the Chemstrand Corporation located in the nearby Research Triangle Park and they employ a great many research chemists and engineers, including about 75 with Ph.D. degrees. . . . We have ample opportunities in this area for engineers who are considering relocation but who must meet the specific requirements of the particular industry, and we certainly expect the volume to increase in the future. . . .

Shown left is a scene from Cape Canaveral, Florida, where continuing experiments in space travel have created an almost constant demand for engineers. Below—Industries in North Carolina provided many of the parts for the Nike-Hercules surface-to-air guided missile shown here.

"I would not say that engineers at the present time are in short supply in our area as a general statement, but I would say that some of our manufacturers are constantly looking for experienced engineers who would fit into a special category. We find that engineers and scientists regard this area very highly, with its cultural and educational background and it is possible for an engineering student to secure a complete education from grammar school to Ph.D. Our facilities here are especially strong in nuclear engineering."

In Florida, a recently compiled Inventory of Engineers and Scientists projected to the 1970's calls for nearly 200 per cent increase in engineers in that state. James F. Shiveler, P. E., is the president of the Florida Engineering Society, and translates this huge increase into a more detailed breakdown. "It is my impression that in some important specialty areas we do not, at the present time, have an adequate supply of available talent. With regard to private practice, while there is always room, as the saying goes, for another competent man, by and large the supply of talent seems to be satisfactory. In the government field I believe that a shortage does exist of qualified people to fill responsible engineering positions. . . .

"Florida in recent years has experienced a tremendous increase in industrial activities requiring engineering talent. The Martin Co.'s plant in Orlando, for example, employs approximately 2700 engineers of which number approximately 2100 have B.S. degrees or better. It is my understanding that industries of this type, and there are now a number located in Florida, are experiencing a shortage of engineering talent in some of the technical specialties. . . .

"Needless to say Florida is one of the states in the South which is encouraging industrial development. . . . It is my opinion, however, that we do not have in the state an adequate pool of skilled engineering talent to immediately fill the needs of these new industries as they come in. . . .

"I do believe that Florida is a

(Continued on page 52)

an American Engineer SPECIAL REPORT

CSC Survey Forecasts Gov't Programs Will Create 30,000 Jobs for Engineers

ALMOST 20 per cent more engineers will be employed by the Federal Government in 1963 than there were in 1958, according to a recent survey by the Civil Service Commission. The growth in Federal engineering jobs will be part of an across-the-board increase in the demand for technical personnel by the United States Government.

All told, this will mean something on the order of 74,000 new engineering jobs in the Federal Government during the 1958-1963 period. Actual new jobs will account for about 30,000 of these positions, while turnover will create the need for about 44,000 new Federal engineering employees. By 1963, a total of about 65,550 engineers should be working for the Government.

As the accompanying chart shows, these jobs will be in just about every conceivable branch of engineering. The demand will be concentrated at the bachelor's degree level, with sharp competition for a relatively smaller number of engineers holding graduate degrees. While the supply of such engineers will improve in the period covered by the survey, the Civil Service Commission predicts that Federal agencies may still lack about ten per cent of their needed growth. The Civil Service projection anticipates a 6.9 per cent drop in the number of engineering bachelor's degrees from 1959 to 1963. At the master's and doctor's level, there will be increases of 3.6 and 26.1 per cent respectively for the same time period, the report says.

The projection is based on a number of assumptions. First, that over-all economic conditions will continue at reasonably high levels throughout the forecast period. Second, that the international situation will remain substantially the same. And third, that sufficient funds will be available to support these future activities which the agencies surveyed were planning. Further, the survey assumes that any occupational trends identified in studying the ten agencies surveyed wll be characteristic of the Federal Government as a whole. Those agencies surveyed were the Departments of Commerce, Agriculture, Interior, Air Force, Army, Navy, Health, Education and Welfare and the Atomic Energy Commission, National Aeronautics and Space Administration and the Veterans Administration.

Actually the situation of the Federal Government is essentially an intensification of the conditions prevailing throughout the nation's work force. While science and technology claimed only one of each 323 workers in 1900, and one of 98 in 1940, today the ratio approaches one in every 50 workers. And in the Government, because of the central role it plays in so much research and development work, the ratio is more on the order of one in every six—or seven per cent. Already, six per cent of the nation's engineers work for the Federal Government, almost twice the proportion of the three-per-cent-of-total-work-force figure comprised by the entire Government. These are the current figures. A quick glance at the makeup of recent Federal budgets shows clearly that more and more technical work is being handled by the Government, and the logical assumption is that the existing situation can only intensify itself.

More generally, the Civil Service Commission has the following predictions to make. The Government will unquestionably continue to be a major employer of engineers and other technical personnel. Through their contracts with private industry, Federal agencies will continue to exercise considerable additional influence on the demand for these occupations in the rest of the na-

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Chart of predicted growth from 1958-63 by branch and number of engineers.

The Branches: How Many More?

	1958	Increase	1963
Airways	307	95.5 per cent	600
Bridge	220	59. " "	350
Agricultural	992	56. " "	1550
Petroleum Products	139	44. " "	200
Electronic	6358	40.5 " "	9300
Aeronautical	3186	30. " "	4150
Highway	1520	28. " "	1950
Chemical	994	25.5 " "	1250
Mechanical	6958	21. " "	8450
Materials	839	19. " "	1000
Hydraulic	1820	18. " "	2150
Civil	6264	15. " "	7250
Internal Combustion Power Plant	1053	14. " "	1200
Marine	621	12.5 " "	700
Electrical	3750	12. " "	4200
Industrial	1292	12. " "	1450
Ceramic	45	11. " "	50
General	9012	10. " "	9900

Report on a Case by the Board of Ethical Review

The Board of Ethical Review was established to provide service to the membership of the NSPE by rendering impartial opinions pertaining to the interpretation of adopted Canons of Ethics and Statements of Policy regarding professional conduct. The *American Engineer* will print findings on specific cases as they are reported by the BER to the NSPE Board of Directors.

Case No. 60-6

Subject:

Practice in Other Than Major Field—Section 4, Canons of Ethics; Section 23, Canons of Ethics; Rule 27, Rules of Professional Conduct; Rule 45, Rules of Professional Conduct.

Facts:

Engineer "A" has a degree in mechanical engineering and is registered as a professional engineer under the state engineering registration law. He has had 15 years of experience in mechanical engineering work, including 7½ years of mechanical and electrical design of all types of buildings. He has designed the electrical systems for several buildings.

Engineer "B," holder of a degree in electrical engineering and registered as a professional engineer under the state law, filed a complaint with the state professional engineering society, alleging that Engineer "A" had acted unethically in designing electrical systems in view of his education and registration based on his proficiency as a mechanical engineer. The complaint does not question the competency of Engineer "A," nor were any plans submitted by Engineer "B" to sustain a charge of lack of quality of the design work of Engineer "A," even though such plans were requested by the state society.

Questions:

1. Is Engineer "A" unethical in practicing electrical engineering when his major field was mechanical engineering? 2. Is Engineer "A" unethical in practicing any branch of engineering other than his major field, provided he is competent to do so? 3. Is Engineer "B" required to show by exhibits that Engineer "A" is incompetent?

References:

Canons of Ethics—Section 4,—"He will have due regard for the safety of life and health of public and employees who may be affected by the work for which he is responsible."

Section 23—"He will not directly or indirectly injure the professional reputation, prospects or practice of another engineer. However, if he considers that an engineer is guilty of unethical, illegal or unfair practice, he will present the information to the proper authority for action."

Rules of Professional Conduct —Rule 27—"He will not undertake responsible engineering work for which he is not qualified by experience and training."

Rule 45—"He will report unethical practices of another engineer with substantiating data to his professional or technical society, and be willing to appear as a witness."

Discussion:

The Canons and Rules are clear that an engineer has a right and duty to bring charges of unethical conduct when he believes that a fellow engineer has acted improperly. But merely bringing charges is not a full discharge of his responsibility. He must, under Rule 45, present substantiating data, which he failed to do in this case, or, at least, explain why he cannot present such substantiating data and indicate to the best of his knowledge how and where the full facts may be obtained.

Rule 27 leaves no doubt of both its negative and positive admonition. Negatively, it prohibits responsible practice by one not qualified for the work at hand. Positively, it therefore must be read to permit any engineering work for which the individual is qualified. Whether or not an engineer is qualified for particular work is a question which can be determined only on the basis of demonstrated technical knowledge as shown by experience and training. While the type of technical education in an engineering school is a material factor in this evaluation, it is not controlling or all-inclusive.

It is known and accepted fact that one's training and experience continues throughout a professional career and it would be folly to assume that an engineer could never become qualified beyond those subjects which he studied in college. It is beyond doubt that a large number of engineers (perhaps even a majority) move into new or related fields of professional endeavor as they gain experience after their college studies.

The trend in engineering registration is to issue a license as a "professional engineer" without designation of branch, although the applicant may be examined in a particular branch. Whether this trend is a wise or proper one is outside of our jurisdiction. It does emphasize, however, insofar as the public is concerned, the importance of adhering to Section 4 of the Canons and Rule 27. The profession must be alert to possible violations of these two injunctions and be ready to take prompt and effective disciplinary action for any breaches. This cannot be accomplished without complete and detailed information as to alleged violations. The analysis of the disciplinary body must rest upon the technical competence and ethical conduct of the engineer as shown by the evidence of his work.

Conclusions:

Q. 1—Engineer "A" did not act

(Continued on page 56)

How Well Do Engineering Salaries Stack Up?

If money won't buy happiness, it will provide the down payment on a lot of things that will ease misery, and it will certainly keep the refrigerator full during the interim.

This is probably the reason why, when people have run out of other things to worry about, they worry about salary and income. In this respect, engineers probably aren't too different from anybody else—expect that their mathematical background perhaps tends to cut down the amount of time that they might otherwise spend worrying. Another reason engineers as a group spend less time fretting about income and outgo is simply that they have less to worry about than most people: If engineering isn't the highest paid profession in the country, it nonetheless stacks up favorably in just about any comparison, and offers a growth rate that is altogether respectable.

But for the engineer who is in the mood to consider engineer earnings, there couldn't be a better year than 1961. The reasons for this are two-fold. First, National Society of Professional Engineers will soon publish a survey of engineer salaries in 1960 covering over 40 per cent of the membership of that organization—some 24,000 engineers, a figure which represents the hard core of truly professional engineering in the United States. (See story, page 8.) Concentrating on registered professional engineers, the NSPE survey will give a complete and detailed rundown on what they earn in industry, government, private practice, by the branch in which they work and by geographical location in accordance with practically any criteria that could be developed.

Second, the Engineering Manpower Commission of the Engineers Joint Council has recently published a salary survey of its own, covering about 200,000 engineers in all phases of engineering. With the broader base, the EJC survey was somewhat less selective in its data, resulting in a more general rundown on engineering salaries in the country. The basic differences between the two surveys follow logical expectations. The NSPE survey shows a higher median age, a higher median salary (just over ten per cent) and a slower rate of median salary growth over comparable periods. This obviously results from the more highly professional character of the engineers surveyed by NSPE. That NSPE concentrated on the registered professional engineer inevitably led to survey results which stressed the older, more mature, better established engineer.

But while the NSPE salary survey was geared to the top echelon of the engineering profession, the EJC document probably offers better material for comparison, simply because of its broader approach. Even taking the slightly lower salary factor that the EJC survey offers, engineers are doing as well or better than many other major professional or nonprofessional groups in the nation. Not only have engineering salaries kept pace with the steadily advancing cost of living, but they have lately man-

Median Income by Grade (1960)

	GRADE								No. of Survey Respondents
	1	2	3	4	5	6	7	8	
Total U. S.	5,570	6,230	6,890	8,640	10,450	12,260	15,520	21,930	24,326
Region									
1. (New England-Middle Atlantic)	*	6,190	6,890	9,130	10,990	13,500	16,660	24,090	not yet available
2 (South)	*	6,420	6,960	8,520	10,340	11,930	14,880	17,320	"
3 (Midwest)	*	6,170	7,120	8,750	10,480	12,460	15,640	24,930	"
4 (Plains)	*	5,960	6,750	7,970	9,550	11,320	14,140	20,310	"
5 (Southwest)	*	6,250	6,720	8,140	9,900	11,690	15,160	20,040	"
6 (West)	*	6,810	6,980	8,750	10,420	11,640	14,920	17,800	"

aged to stay well ahead of it. While the major increases in the past seven or eight years have come for the lower grades of engineers, the higher grades have progressed only slightly less, and as a whole the profession is essentially booming at a rate faster than the economy itself.

A few statistics perhaps give the best indication of just how well the engineer fared in 1960. According to the NSPE survey, his median income was $10,660, up more than six per cent from two years before. If he was among the top ten per cent of his profession, he earned in excess of $19,000 during 1960, and even if he was only among the top 25 per cent of his profession, he received gross income of at least $13,750 for the year.

Focusing on the high end of the salary spectrum, slightly over 12 per cent of those replying to the NSPE survey earned salary or income over $18,000 during 1960. This includes almost 3,000 of the working U. S. engineers replying to the survey. Just under half of these were employees. The remainder were self-employed or in some other category. In this higher bracket, over two dozen of those reporting set their earnings at a figure above $100,000. From $50,000 up, almost 200 engineers were included. This represents nearly a full percentage point of those reporting.

What does this mean? An obvious comparison is with the Soviet Union, where heavy stress is admittedly placed on science and engineering, where the engineer is the darling of a state which can offer virtually anything it pleases in the way of incentive, remuneration or reward. According to a recent newspaper article appearing in the Washington *Daily News*, it is generally accepted that Prof. Alexander N. Nesmieianov, president of the USSR's Academy of Science, is not only the highest paid scientist in Russia, but is perhaps also the highest paid individual in the nation. This is how his salary stacks up, according to the *News*:

"While Soviet law fixes $36,000 per year after taxes as a Soviet citizen's top salary, Prof. Nesmieianov makes additional money from book royalties, lectures and newspaper and magazine articles. His total net income is estimated at $90,000. In addition to this, the state provides him with a deluxe Zis limousine, Russia's equivalent for the Cadillac, complete with chauffer, plus a luxurious apartment in Moscow and a 'datcha' or country seat. Almost equally high pay and similar privileges are enjoyed by over three score other Soviet scientists."

The article adds, "These men undoubtedly form the most highly prized and best treated group inside the Soviet community." Impressive at first glance, this comparison takes on a slightly different light when it is put in a proper context. If "over three score" Soviet scientists and engineers are in this particular salary bracket, bear in mind that NSPE's salary survey included two-thirds as many engineers making $90,000-plus with only a sample of one segment of the profession in this country. Bear in mind also that this is the top man—or men—in the most favored profession in the Soviet Union, and that the government is in a position to dole out—or withhold—whatever favors it considers appropriate. And consider the size of the engineering profession in a nation such as Russia where over 100,000 engineers are pumped into the profession each year. Thus, even discounting the variances in dollar/ruble comparison and the standard of living in the two nations, it certainly appears that the American engineer as a whole is probably better taken care of.

Any attempt at comparing salary scales is doomed to approximation from the beginning. Size of sample, method of gathering data, points of comparison, and purpose of the survey are only a few of the variables that must be taken into account.

As a result, it is fortunate to be able to find a survey that has covered the same ground for a group of professions and job categories, using comparable samples and criteria in each case. Such is available through a recent publication by the Labor Department's Bureau of Labor Statistics, called a "National Survey of Professional, Administrative, Technical and Clerical Pay." While this booklet does not cover all professions, and fails to offer the detailed breakdown available in the NSPE survey, it is nonetheless valuable as a means of comparing engineering with such other professions as law, accountancy, mathematics and chemistry. Breakdown of the various salaries is by grade in the profession concerned. This grade is determined by such factors as experience, responsibilities, type

(Continued on page 49)

Engineer-Teacher Earnings

Rank	Salaries	Income
Instructor	$ 5,392	$ 6,500
Asst. Professor	6,689	8,500
Assoc. Professor	8,200	10,250
Professor	10,500	13,200
Lecturer	6,100	7,500
Department Head	11,700	13,700
Dean	13,500	15,420

Over-All Earnings

	1960	1958
Lower Decile	$ 7,140	$ 7,040
Lower Quartile	8,580	8,250
Median	10,660	10,000
Upper Quartile	13,750	13,260
Upper Decile	19,680	19,680
Total number in survey	24,326	18,713

Programs, Problems and Priorities at Purdue

A survey of attendants at the Annual State Presidents' Conference last month sheds light on what's needed in the state societies to make the coming year profitable and successful.

THE easiest way to gain a reputation as a brilliant conversationalist is to develop the knack of listening to other people's problems.

With something not too far from this in mind, AMERICAN ENGINEER decided to ask those attending the annual Purdue State President's Conference just what problems they had, and what they considered to be their most important programs in the months ahead. Surveyed were representatives from practically every state in the union—those high ranking members of the state societies who will be charged with fulfilling the myriad programs that make up the successful operation of a professional society.

The purpose of the survey was two-fold. First, National Society Headquarters wanted to find out which programs were most important in the various states. The aim: Better service, with emphasis placed where it is needed, on the programs that are causing most concern at state level; second, through the pages of the AMERICAN ENGINEER, it was felt that individual society members could be better informed on the problems their state society is facing. The goal here is to stir up thought on the problems and most important programs at the grass roots level, where the ideas for progress must inevitably begin.

What happens when you ask over fifty top representatives of a profession what their problems are for the coming year? In terms of their single most important program, the answers looked like this:

"Without question, the single objective of rank and file engineers is to wipe out the cobweb thinking that keeps the engineering profession from unity. We must head there now and travel faster."

"Improving our state registration law. Our state engineers registration law has not kept pace with improvements in other states."

"Our primary concern will be to promote education among the membership of the fundamental objectives of NSPE."

"Public relations—both among ourselves and among the public at large we want to promote better acceptance as professionals."

"Provide better communications from state society headquarters to the membership. We will do this in the form of newsletters or possibly a quarterly or monthly publication."

Louisiana—James S. Janssen, P.E., (r.): "Our registration law . . . has not kept pace."

Jack D. White, P.E., of Colorado: "Joint cooperation efforts with Colorado Society of Engineers."

Texas—K. M. Smith, P.E.: "Chapter activities is the biggest single item."

W. E. Hedges, P.E., of Missouri: "Proper indoctrination of new members and strong potentials. . . ."

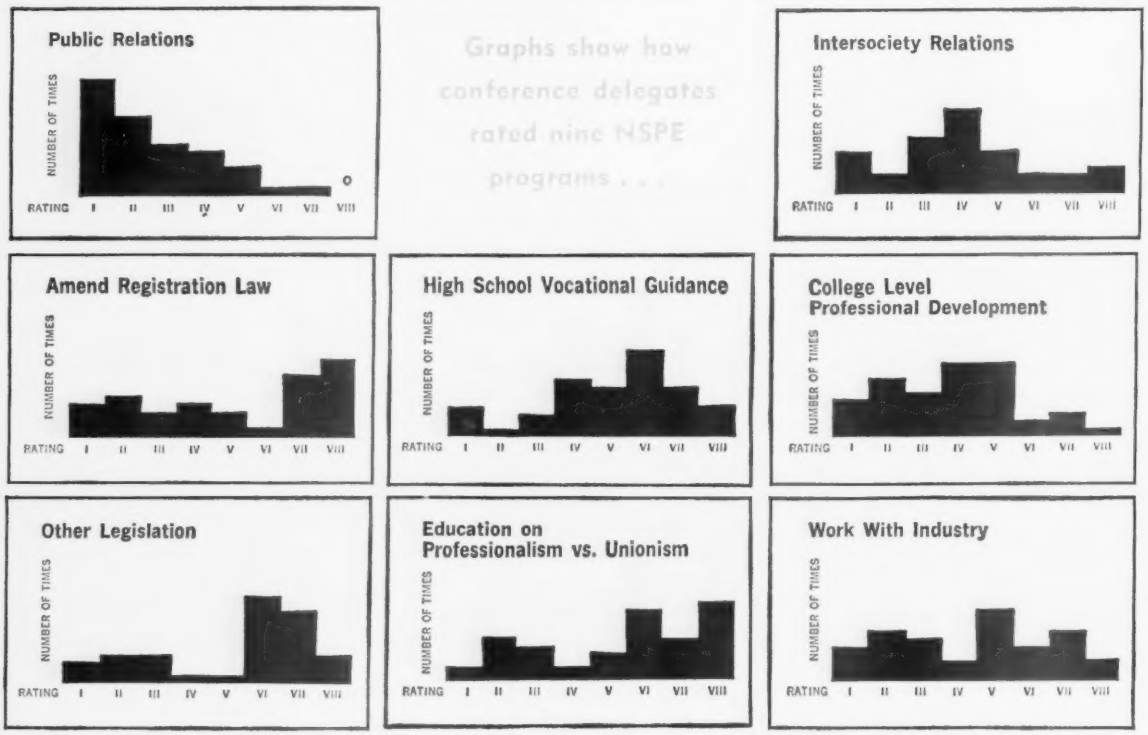
As a double-check on the comments AMERICAN ENGINEER received at the Purdue State Presidents' Conference, the magazine asked those who attended to rank, in order of importance the following eight program areas as they applied in each state: Public relations, registration law amendments, other legislation, high school vocational activities, college level professional development, work with industry, education on professionalism *vs.* unionism, and intersociety relations.

The results bore out the comments already received with remarkably high correlation. The graphs that appear with this article are a summing-up of the results.

Public relations was far and away the most important single item in the minds of those who replied to the survey: Of 46 respondents, 34 rated public relations as either first, second, or third most important. At the other extreme, education on unionism *vs.* professionalism was rated sixth, seventh or eighth in 27 cases.

From an over-all standpoint, college level professional development was a fairly strong second, with 33 respondents rating it between second and fifth in importance. Paradoxically, high school vocational guidance was next-to-last in importance, with 38 people rating it fourth or lower.

Intersociety relations covering the whole broad area of unity was a strong middle rating, with 26 surveyees ranking it third, fourth or fifth. Work with industry received a fairly even rating at all ranks, and the ratings bearing on registration laws and other legislation fairly obviously offer few significant results in terms of numbers. This is so simply because where various laws are needed, they are badly needed, and where they are not needed, they logically receive rather low ratings.



"Ethics is a professional area needing much activity among all engineers to create an improved base for an improved profession."

"Securing proper representation of professional engineers on various state commissions, advisory committees, planning committees, etc."

"The largest segment of our profession is in the area of industry. It is our intention to do all possible to appeal to this segment of the profession. This will be done by attacking unionism with vigor."

"Most attention will be devoted to firmly establishing the JETS (Junior Engineer Technical Society) program. It is important to set engineering in its proper perspective and encourage the most likely candidates to pursue this course of study."

This is the cross-section. As a rule each of the above comments represents more of the same. When totaled, the results form a definite pattern. Under the general heading of communications and public relations, there were fifteen "most important" ratings. Intersociety and interprofessional relations accounted for the second largest group with seven mentions. Following these two largest categories were: Legislation, with five mentions; professional development, five mentions; chapter improvement, four mentions; ethics, two mentions; hiring an executive director, two mentions; and other various items, numbering seven in all. The total: 47, representing just about every

E. R. Baumann, P.E.
"Unity . . . we must head there now and travel faster."

Theodore Jaffee, P.E., and R. C. Roberts, P.E., of Alabama: "Transmitting the program in a professional manner is of paramount importance. . . ."

area of the nation, and societies of all sizes and composition.

The measure of the diversity of the respondents is best shown by the reasons for picking one area of operation as "most important." Parenthetically, although membership was ruled out as an answer to the survey, it cropped up in a variety of forms. For instance:

Thomas A. Turner of Nevada rated chapter programs and activities most important, "in order to hold the interest of the membership and to gain the active support of some of the men we seem to be losing. This would also offer more of an inducement to obtain new members."

Darrel A. Riechel of Oregon: "Educating members regarding the operation and value of NSPE to our state organization. Much of our membership problem seems to stem from ignorance of NSPE activities and objectives."

Frank H. Bridgers of New Mexico: "Effective public relations among our own members to maintain active membership."

R. W. Loveless of Ohio: "We have 5300 members. We cannot keep them all working or reading and too many drift away from activity too easily. We must advise them better, pull them back at least to some degree, then convince them what we are doing and sell them."

C. W. Burch of Mississippi: "Better communication is vital to maintaining and increasing interest of the members and the effectiveness of the society."

NSPE Vice President Ben G. Elliott said it was most important to "push young engineers actively, to develop a program of professional development in colleges of engineering." Why? To provide a "supply of properly oriented young engineers into the profession and NSPE."

Membership notwithstanding, communications seems to be an area that is recognized as a vital one, regardless of the size of the state society, or for that matter in what part of the country it is located.

R. C. Roberts from Alabama: "Transmitting the program in a professional manner is of paramount importance in order to build up not only prestige but also a willingness to participate."

W. E. Hedges of Missouri: "We will stress personal, man-to-man and fireside chats with new members . . . experience in other organizations shows the value of proper indoctrination of new members and potential members."

J. M. Martin of Idaho: "We must face the problem of explaining the work, place and service of the professional engineer in our state. . . ."

Charles V. Bonhag of New Jersey: "Most of the public and many of our own members are not familiar with our activities, our aims and what we are accomplishing for the engineer and the public. Every officer and every member will be asked to become a member of this P. R. force."

John Bolen of North Carolina: "Both among ourselves and among the public at large, we want to promote better acceptance of engineers as professionals. . . ."

The problem of cooperation with other societies and professions ranked high among the state presidents, presidents-elect and other officers who attended the two-day conference at Purdue. Big and little states alike were anxious to make headway in this area.

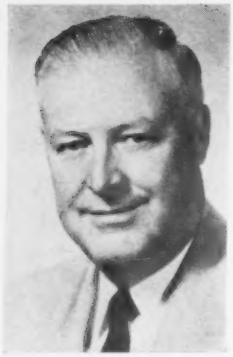
Said Michigan's R. A. Little, "Coordination of and developing cooperation among the various factions making up the profession of engineering in Michigan appears to be the main stumbling block to acceptance for the Michigan SPE's true position in the picture."

Jack D. White of Colorado: "Joint cooperative efforts with Colorado Society of Engineers on state magazine, convention, etc., could lead to merger later which might triple our membership."

Karl O. Werwath of Wisconsin rated as "most important" the job to "resolve the engineer-architect conflict," and in Nebraska, the problem is to set up a "merger with the Nebraska Engineering Society. We are attempting some forward step toward unity."

Quite logically, then, the current of membership ran through a heavy majority of the answers that the survey received, which was true in spite of the request that membership as such not be used. While the importance of membership cannot be stressed too much, it is equally worthwhile to note the many ways in which a diverse group of state societies will be going after it in the coming year.

All in all, it looks like a busy year ahead, regardless of the state society involved. It is up to the individual member to help generate the ideas, enthusiasm and support that successful handling of these important problems will require.—**End**



TOWARD A MORE UNITED PROFESSION

By
GARVIN H. DYER, P.E.
Past NSPE President
Chairman, Inter-Society Relations Committee

A suggested plan for the extension of NSPE membership to qualified but unregistered engineers.

In proposing the Functional Plan in 1956 (See AE, July, 1957) the American Institute of Electrical Engineers also suggested that NSPE temporarily open its membership to nonregistered engineers, who are otherwise qualified as evidenced by their holding suitable grades of membership in one or more of the technical societies. As a result of this suggestion, NSPE sought an expression of opinion from its membership through a poll of its local chapter and state society officers. The result of the survey indicated a majority opinion in favor of continuing registration as an essential requirement for membership at the National level. The survey, however, did reflect a strong sentiment for continued study of the matter.

Reporting on the survey to the 1958 Annual Meeting, the Committee on Improved Professional Activities commented: "Paragraph No. 6 of Dr. Coover's letter to the AIEE members said, in part . . . 'NSPE should put itself in a position to represent the profession more completely by expanding its individual membership organization to include those qualified members of the profession whose work does not by law require registration as well as registered engineers. . . .'

"As the AIEE proposal, as expressed by Dr. Coover, affects some basic philosophy of NSPE, your Committee felt it essential to obtain an expression of opinion from the membership, speaking through their chapter and state society officers. There are a number of ways in which this objective could be accomplished. Accordingly, five plans, together with a simple questionnaire, were sent in December, 1957, to the 360 chapter presidents and 46 state society presidents for an expression of opinion.

"The results of the survey indicated that the majority opinion of those who responded was in favor of continuing registration as an essential requirement for membership.

"There was, however, considerable expression of opinion for considering membership of nonregistered but qualified engineers, who are members of technical societies who subscribe to ECPD standards of membership, with and without the right to vote at various levels of our organization. This reflects the desire of the respondents to extend the membership of NSPE in any reasonable way to assist in the implementation of the AIEE plan and to advance unity of the profession."

The results of the survey also indicated that none of the five plans submitted, or the variations thereof, met the approval of a majority of the respondents, or that the respondents were somewhat confused by having so many plans before them at one time. A study of the returns and the comments accompanying them also indicated a strong desire to have a single, well-thought-out plan proposed for consideration.

The Inter-Society Relations Committee took over the activities of the Improved Professional Activities Committee in 1958 and since that time has devoted much time and effort to a continuing study of the AIEE suggestion. This was the subject of a number of questions included in the opinion poll of the membership on organization of the engineering profession in 1960. The Committee has extensively discussed the subject at several of its meetings. Every effort has been made to discuss the matter in all possible ways with as many members of the Society as possible. The Committee has also extensively discussed the subject with representatives of other engineering societies.

It has been pointed out that many prominent and well qualified engineers who are practicing today graduated from college and started their careers before there were registration laws in their particular states. These engineers could have and probably should have registered under a "grandfather clause." However, it must be realized that many of these laws were not too effective at that time. They did

not require engineers in many areas of activity to be registered, and there was much misunderstanding concerning them. In fact, up until a few years ago, engineering registration laws were considered by many to be in an experimental stage of development.

A number of these engineers are employed in positions which even today do not require registration as far as the law is concerned. Many have been practicing in specialized fields for years and have become quite prominent in these fields. They are fearful that they cannot pass an examination in fields outside of their specialties without many hours of preparation, which time they do not have. Some are also fearful of jeopardizing their prestige by failing such an examination.

Many of these engineers have done much for this nation and for the engineering profession. We owe them our assistance and consideration. A number could be registered under "eminence" clauses but are not aware of that fact. It has been pointed out that possibly by getting them closer to NSPE, where we know them and their problems, we will have a better opportunity of helping them to be registered.

It has also been said that we are going through a transition period in our profession and that it takes years to work these matters out. In the meantime, we cannot forget the rights of such a group as we are considering here. Certainly they are entitled to representation in professional matters as envisioned by the Functional Plan. How else can they obtain such representation except through membership in NSPE?

In fact, the Functional Plan is based on the concept that every engineer should be a member of both his technical society and his professional society. This is also a stated policy of NSPE. Through his technical society, he is represented in EJC and ECPD in matters of technical and educational coordination. Through his membership in NSPE, he would have representation in professional matters. The problem of fully implementing the Functional Plan arises from the fact that a number of qualified engineers, for one reason or another, are not registered and, therefore, under the present membership requirements of NSPE, cannot be members of NSPE and represented professionally by our organization. This was the basis of the AIEE suggestion that NSPE consider opening its membership temporarily to this group.

ASME, as well as several other engineering societies, has likewise urged NSPE to give serious consideration to the AIEE suggestion. Possibly no other action by NSPE could so well prove to these societies NSPE's sincere desire to cooperate with all engineering societies in an all-out effort toward effective organization of the profession.

In its consideration of this question it is believed that NSPE should keep three objectives in mind: (1) The best plan which would enable NSPE to directly and effectively represent qualified engineers in professional matters; (2) to accomplish the above objective without actually diluting the quality of NSPE membership or seriously affecting its prestige or service effectiveness; (3) to demonstrate to the profession NSPE's willingness to cooperate in every way possible, without jeopardizing its service effectiveness, in order to attain unity in the profession.

After due consideration of all of the above factors, the Inter-Society Relations Committee has developed a suggested plan. In developing this plan, the Committee has endeavored to the best of its ability to fulfill the stated objectives, as well as the desires of the NSPE membership expressed through personal comments and in the returns of the two polls referred to above, and at the same time giving due consideration to the needs and suggestions of other engineering societies. It is obvious that no single plan could completely meet all of these requirements or even all of the ideas of all of the members.

The Committee, however, plans to present a suggested plan to the Annual Meeting in Seattle. It is expected that this plan will be along the following lines:

(1) That a classification of membership be established in the National Society of Professional Engineers to be known as "Member." There would then be three classes of members in NSPE: Professional Engineer Member, Member, and Junior Member.

(2) Those holding "Member" status shall have all of the rights and privileges of "Professional Engineer Members" except that of holding office in the National Society.

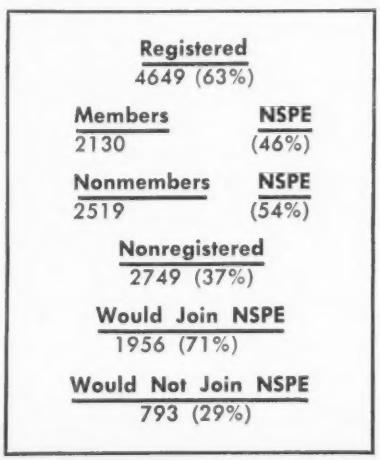
(3) A "Member" would be defined as: A person not holding a valid license or certificate of registration as a professional engineer issued under the laws of any state or a province or territory of Canada but who is a member of an approved National Engineering Society in a grade of membership to which only registered professional engineers will be admitted in the future.

(4) An approved National Engineering Society would be defined as:

a. Any of the five Engineering Founding Societies (AIChE, ASCE, AIEE, ASME, AIME) who shall, as of a specific date, require the holding of a valid license or certificate or registration as a professional en-

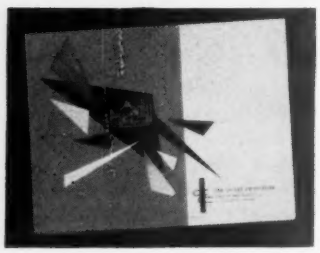
(Continued on page 54)

The AIEE Board of Directors in 1958 sent questionnaires to 13,905 of their Fellows and Members in the United States to determine how many members who were registered professional engineers belonged to NSPE at that time, and how many of those who were not registered would affiliate with NSPE if membership were available to the nonregistered engineer. The results are shown below.



New Literature

PRODUCTS AND MARKETS—A new 12-page brochure, detailing their experience and facilities has recently



been released by The Cerand Corporation, an affiliate of the Clarkeson Engineering Company which is active in developing new products for the construction industry, developing new uses for raw materials and solving complex civil engineering problems. The new brochure contains a step-by-step chart and explanation of how Cerand works in conjunction with management and other departments of its client companies. One section of the brochure outlines present production and market development opportunities for all possible suppliers to the construction industry. Another section describes civil engineering applications of interest to military, federal, state and municipal authorities as well as industry. Also included is a listing of some of the Cerand Corporation's major study, research and development projects.

(Circle 15 in Readers' Service Dept.)

TROLLEY CONVEYORS—What a trolley conveyor can do to reduce manufacturing and handling costs and how to select the right trolley conveyor for any requirement are the two main topics of a new 58-page book, 2730, "Trolley Conveyors," just issued by Link-Belt Company. Examples of many installations are shown with combinations of photographs and layout drawings, from small relatively simple jobs up to the most complex systems found in some of the most highly complex plants. The book also shows how trolley conveyors aid in many tasks required in modern industry, such as washing, finishing, drying, baking, cooling, assembly, testing and storage. Included is complete information for design of a trolley conveyor system, with appropriate components, supports, superstructures and guards. Complete tables of materials, dimensions, and specifications of components, easy-to-read drawings and cut away photographs showing construction features are given.

(Circle 16 in Readers' Service Dept.)

ECONMOBILES—American Road Equipment Company has released a series of product information catalogs that contain condensed detailed descriptions of the Econmobile jobsite materials handling vehicles. Sheets on American Road's Econmobile Models 600 and 620 includes basic unit information and data sheets containing a photograph, specifications, capacity, dimensions and other technical data. Full technical information on attachments and other modifications including the pallet fork 686, pallet fork 686T, towers, aggregate buckets and ground and aerial tools. Other accessory sheets are also provided. Product Files are available on the Econmobile and on the Pacer vertical mast fork truck.

(Circle 17 in Readers' Service Dept.)

BOILER BULLETINS—The Superior Combustion Industries Inc. have published bulletins describing their complete packaged boilers "Type CC" for capacities from 670,000 BTU/hr., and their "Type D" for capacities from 11,000 to 61,000 lbs./hr. Charts showing the data and dimensions of each type of boiler are given, along with cut away views and diagrams showing the various parts in detail. Insulation, fuels, firing and draft are discussed in relation to each boiler and the pertinent parts.

(Circle 18 in Readers' Service Dept.)

POWER SUPPLY HANDBOOK—A new DC Power Supply Handbook and Catalog is now available from Dressen-Barnes Electronics Corporation to anyone interested in DC power design or procurement. This new 24-page manual includes a step by step procedure designed for engineers who wish to calculate packaging dimensions for multiple DC outputs. Considerations include spacing problems for modular DC power supplies under various conditions of ambient temperature, external cooling and rated current. The catalog details over 200 power supplies plus 1,000,000 combinations of kitted modules.

(Circle 19 in Readers' Service Dept.)

EROSION CONTROL—A more effective and less costly approach to the age old problem of controlling soil erosion has been announced by Gustin-Bacon Manufacturing Co. The new concept involves the use of a glass fiber mat, G-B Ultracheck, for the reinforcement of soil surface. Much the same principle is now generally employed for the reinforcement of plastics and other material. Tested over a period of three years under actual conditions in conjunction with state highway officials, the new method has proved very effective and economical. In addition to low material costs, G-B Ultracheck is reported to be economical to install. Continuous blankets, 6′ wide and 150′ long are simply rolled out over a graded and smoothed area, toed-in on all edges and pinned in place with steel "T" pins. Installation costs are reported to range from $1 to $2 per square yard. An 18-page brochure containing "before-after" case histories is available.

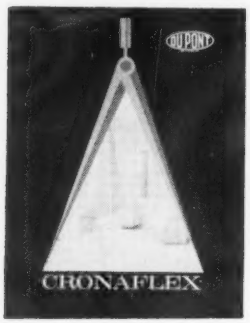
(Circle 20 in Readers' Service Dept.)

MANUFACTURING FACILITIES—Hardinge Manufacturing Company, a subsidiary of Hardinge Company, Inc., has just released a new, 16-page catalog, Bulletin 101, describing its various tools and fabrication facilities. The Hardinge plant has been modernized and expanded over a several year

period. The foundry pours both "Meehanite" and "Ni-Hard" metal, specializing in "pit-molded" castings. The machine shops contain some of the largest tools in the area. The plate shop cuts, rolls, forms and welds heavy plate items as large as ten feet in diameter by 100 feet in length. The assembly department specializes in custom-made machinery.

(Circle 21 in Readers' Service Dept.)

ENGINEERING FILMS—DuPont has made available a series of brochures and bulletins describing in detail the



various uses which can be made of their Cronaflex engineering reproduction and drafting films. Among the jobs Cronaflex can be used for are photodrawing, map coding, photogrammetry, preparing printed circuits. Some of the advantages offered by the new product are said to be superb drafting surface, durability, kink resistance, photographic versatility, dimensional stability and fast print-back speed. Charts showing the many sizes available in both sheet and roll Cronaflex.

(Circle 22 in Readers' Service Dept.)

FIELD COST ACCOUNTING—A "Suggested Guide for Field Cost Accounting for Building Contractors" has been published by the Associated General Contractors of America. While intended to be adapted for use to fit circumstances, the booklet emphasizes that it is essential that general contractors "use some well-defined procedures and systems." The booklet is presented in three parts: (1) Preparation of the project estimate using a standard system; (2) job labor and material cost distribution covering the recording and distribution of field labor and material to a standard cost accounting system; (3) the preparation of cost reports in a manner that will give the company a complete and realistic forecast of the job outcome, and give management a clear picture of field costs vs. the estimated field costs, commitments vs. material and subcontract estimates, and, equally important, up-to-date and accurate figures for the bank and the bonding company.

(Circle 23 in Readers' Service Dept.)

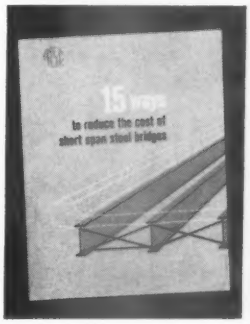
SOLDERING AND BRAZING—A four-page, two color brochure describing new "economic automation processes" in soft soldering and silver brazing is available from Fusion Engineering. The new brochure describes the unique method of automating production soldering and brazing operations with paste alloys, describes briefly three series of paste materials available, and gives four case history examples of cost savings achieved through installation of automatic, and manual equipment. In automatic installations cost savings of $25,000 and $18,000 per year are illustrated with investments of $3,500 and $2,500 respectively. With semi-automatic installation savings of $10,000 per year with an equipment investment of $450 is shown. The brochure also incorporates a partial list of users as well as typical customer parts which have been automatically soldered using the Fusion process.

(Circle 24 in Readers' Service Dept.)

MESH BELT FURNACES—A bulletin just published by Harper Electric Furnace Corporation, No. MB-960, describes and illustrates a modernized line of 17 straight-thru mesh belt furnaces for continuous brazing, annealing, and sintering operations. Included are complete specifications on all electric and gas fired models with heating chamber lengths from three to eleven feet, as well as information on construction details and optional equipment available.

(Circle 25 in Readers' Service Dept.)

SHORT SPAN BRIDGES—"15 Ways to Reduce the Cost of Short Span Steel Bridges" has just been published by



the American Institute of Steel Construction as an aid to bridge designers to achieve more bridge with fewer dollars. The free eight-page booklet was prepared to acquaint bridge engineers with the most recent developments and significant ideas in steel bridge construction. The booklet stresses simplified details of fixed and expansion bearings, diaphragms and drainage structures, and suggests design simplifications which present opportunities for sizable cost reductions. In all, the booklet presents 15 ways to reduce the cost of short span steel bridges without the least sacrifice in quality.

(Circle 26 in Readers' Service Dept.)

RELAYS—New data sheet on a line of general purpose relays has just been published by Line Electric Co., a division of Industrial Timer Corporation. Bulletin ten notes that the series MK is available for open, plug-in or printed circuit applications. All types are offered in standard contact arrangements. Detailed coil data and contact nomenclature are provided in two tabular presentations. Series MK relays are available in clear or color tinted hi-impact polystyrene dust tight enclosures, or a cadmium plated steel housing. Color-tinted enclosures red, green, blue, violet and yellow are said to be particularly useful in coding or segregation of circuits.

(Circle 27 in Readers' Service Dept.)

These listings are informational only and are not an endorsement of the products, nor of the manufacturer's claims. To receive any of the new literature described in these columns, merely circle the item number in the Readers' Service Dept. and mail to AMERICAN ENGINEER.

July Meeting Delegates May Preview Seattle's Century 21

A chance to see a world exposition in the making will be among the bonus attractions of this year's NSPE Annual Meeting in Seattle, Wash., July 4-7.

Seattle's Century 21 Exposition, scheduled to run from April to October in 1962, will be in its first stages of construction during the NSPE Meeting, giving those engineers attending a chance to see just how various engineering and construction problems will be handled.

Among the attractions of the $85-million project will be a 600-foot tower topped by a revolving restaurant, the world's first high speed mass transit monorail and a host of other exhibitions that will portray man's life in the year 2000. The mammoth fair will cover a 74-acre site, and over fifty major buildings will be under construction next month.

Points of interest to the engineer will include the Century 21 coliseum, some 400 feet square with a ceiling height of 115 feet above floor level at the center point. The $4-million monorail will cover an area of over a mile in length, traveling that distance when it is completed in about 95 seconds.

The symbolic structure of the world's fair in Seattle—the 600 foot high Space Needle—could well become the fair's greatest "thrill" attraction.

Work is beginning on the unique needle, with a revolving restaurant near the top. The scale model already has been through the wind-testing tunnel at the University of Washington and passed its tests, including its resistance to earthquakes.

The restaurant, capable of seating 220 persons, will revolve once an hour, giving diners a breath-taking view of the panorama of the Cascade Mountains to the East, Mt. Rainier to the South, Puget Sound and the City of Seattle below, and the towering, snow-capped Olympic Mountains on the Olympic peninsula to the West.

Part of the thrill of the Needle will be the trip to the top, where an observation deck will be above the restaurant. Two high speed elevators, travelling at speeds of 800 feet a minute, and providing hold-your-breath viewing through transparent elevator walls, will zoom on outside shafts to the top. Each elevator can carry a capacity of 29 passengers. For those who prefer to walk, two interlacing staircases will have 832 steps each to the top.

The John Graham and Company architectural and engineering firm of Seattle designed the Space Needle when approached by Joseph E. Gandy, Edward E. Carlson and James B. Douglas—the men who envisioned Century 21 more than seven years ago.

That trio wanted a spectacular structure to symbolize the fair. They're now seeing one become a reality. "Safety on a structure such as this is paramount," said Graham. "We have gone beyond the maximum requirements for safety in our engineering of the Space Needle." The three pairs of rigid steel legs supporting the needle-line tower will be anchored 30 feet underground. A central utility shaft enclosing the two stairwells gives futher strength to the structure.

Fair officials also are avoiding the possibility of man-made, or more specifically, children-made hazards with regard to the Needle. While the family will be assured of safe travel to, on and from the top of the high Needle, the safety experts also have their eye on the ground level. There will be no bombardiering of those below.

"Bring in one for SIXTY-ONE"

Already it's June. All the universities and colleges are sending forth swarms of graduates to seek their place in the world. What have you done to welcome young engineers into the profession and our Society?

Program for 1961 NSPE Annual Meeting in Seattle

MONDAY, JULY 3, 1961

9:00 a.m.-5:00 p.m.—Executive Committee Meeting

TUESDAY, JULY 4, 1961

9:00 a.m.—Executive Committee Meeting
1:00 p.m.—Registration Opens
5:00 p.m.—Cocktail Hour
6:00 p.m.—Opening Dinner
The State of the Society
Noah E. Hull, P.E.
President—NSPE
Formal Opening of Professional Meeting
Roll Call of Members of the Board
Reading of Minutes of Previous Meeting
Reading of Communications
Report of Executive Director
Report of Treasurer

WEDNESDAY, JULY 5, 1961

8:30 a.m.—Registration
9:00 a.m.—Professional Meeting Continues
PROFESSIONAL DEVELOPMENT GROUP—
Vice President Elliott, P.E., presiding
Proposed Survey of Current Presentation of Professionalism in Engineering Colleges
W. H. Parks, P.E., Chairman, Education Committee
Successful Completion of Second Year's Activities—NSPE-ARMCO Program
New Approach to Securing Engineering Scholarships
Leland Hobson, P.E., Chairman Scholarship Committee
The "Engineering Faculty Contact" Program
Increasing the Effectiveness of the Student Contact Program
J. Neils Thompson, P.E., Chairman, Student Professional Development Committee

Methods of Recognizing Outstanding Young Engineers
Creation of State Awards
Increasing the Distribution of the Engineer's Record Book
Waldo Wegner, P.E., Chairman, Young Engineers' Committee

10:30 a.m.—Recess for Regional Meetings

12:30 p.m.—Regional Luncheons

2:00 p.m.—Professional Meeting Continues

PROFESSIONAL RELATIONS GROUP—Vice President Stufflebean, P.E., presiding
Board of Ethical Review—Report of Cases
Competitive Bidding for Professional Services
Use of P. E. Seal on Political Advertisement
Contingent Fee Contracts
Association With Non-Registered Engineers
P. G. Ellis, P.E., Chairman, Board of Ethical Review
Should NSPE Admit to Membership Qualified Non-Registered Engineers?
Garvin H. Dyer, P. E., Chairman, Inter-Society Relations Committee
Progress Report on Institute for the Certification of Engineering Technicians
A. C. Friel, P.E., Chairman, Engineering Technicians Committee
Results of Survey on Uniform Telephone Listings
H. W. Honefenger, P.E., Chairman, Ethical Practices Committee
PUBLIC RELATIONS GROUP—Vice President Rouse, P.E., presiding
NSPE "White Paper" on Department of Science
Statement on "Peace Corps"
Restudy of NSPE Policy on Department of Public Works
Proposed Change in NSPE Policy on Promotion of Engineering Research
Harold A. Mosher, P.E., Chairman, Committee on Federal Engineering and Scientific Activities
Status of Film on Professionalism
Use of the NSPE Film as the First Phase of the Public Relations Program
John L. Pratt, P.E., Chairman, Public Relations Committee

Evening **Free**

THURSDAY, JULY 6, 1961

8:30 a.m.-6:30 p.m. Registration

9:00 a.m.-4:00 p.m.—Special series of programs of vital interest to Engineers in INDUSTRY—PRIVATE PRACTICE—GOVERNMENT. (Full details of these programs to be announced later.)

12:30 p.m.—Luncheon

2:30 p.m.—Annual Meeting of Professional Engineers Conference Board for Industry

4:30 p.m.—Family Boat Trip and Salmon Bake at Kiana Lodge

FRIDAY, JULY 7, 1961

9:00 a.m.—Professional Meeting Continues

PROFESSIONAL EMPLOYMENT GROUP—Vice President Backlund, P.E., presiding
The Engineer in Industry in the 1960's—A Professional Program
10 Steps to Professional Engineer-Management Atmosphere in Industry
Compilation of Company Programs to Encourage Professional Development
Proposed Policy Statement on Engineers' Action During Production Workers' Strike
Formation of Functional Section for Engineers in Industry
Current Unionization Developments
R. G. Hoft, P.E., Chairman, Engineers in Industry Committee
Cooperation with Congressional Committees on Missile Base Program
Discussions with Federal Highway Administrator on Policies Affecting Consultants
Study of Consultants' Costs Relative to Construction Costs
Development of State Functional Sections
L. M. Van Doren, P.E., Chairman, Functional Section for Consulting Engineers in Private Practice
Direct Commissions for Engineer Officers in the Armed Services
Separate Classifications System for Federal Engineers
Publication and Distribution of: "The Engineer in State Government—A Study of Merit System Coverage and Personnel Policies"
Current Unionization Developments Affecting Engineers in Government
W. E. Gilbertson, P.E., Chairman, Functional Section for Engineers in Government Practice

12:30 p.m.—Luncheon

Presentation of 1961 Industrial Professional Development Award
Acceptance Remarks by recipient

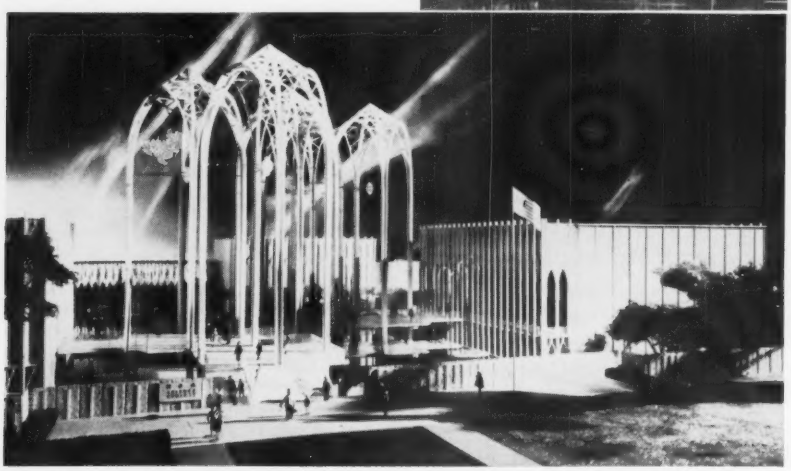
2:30 p.m.—Professional Meeting Continues

ORGANIZATIONAL FUNCTIONS GROUP—Vice President Mann, P.E., presiding
Policy Regarding Public Statements of Functional Sections
Proposed Revisions in Criteria for Formation of Functional Sections
C. R. Hanes, P.E., Chairman, Functional Section Services Committee
Announcement and Presentation of Awards to Membership Contests Winners
Methods for Increasing Membership:
New Membership Kit
Implementing the Training for Membership Plan
H. F. Pierce, P.E., Chairman, Membership Committee
Revitalizing State Society and Chapter Activities
Chapter Evaluation and Scoring System
F. W. Edwards, P.E., Chairman, State Society and Chapter Activities Committee
POLICY OPERATIONS GROUP—Vice President Christian, P.E., presiding
Report of Constitution and Bylaws Committee
G. S. Rawlins, P.E., Chairman Constitution and Bylaws Committee
State Representation on the Board of Directors
L. E. Easley, P.E., Chairman, Organization and Functions Committee
Ways of Correcting Public Misunderstanding of Functions of the Engineer

Century 21 Exposition

Shown right is the "Space Tower" which is under construction in Seattle for the Century 21 Exposition. The 600-foot tower is topped by an observation deck and a 220-seat restaurant which revolves once each hour affording a view of the lakes and mountains surrounding the city.

Five arching towers (below) highlight the entrance of the United States Science Pavilion designed for Century 21. Part of a $9,000,000 Federal program of participation in America's Space Age World's Fair, the Pavilion is a complex of five structures joined around a courtyard pool and fountains.



Thoughts on Professionalism...

By PAUL H. ROBBINS, P.E.
NSPE Executive Director

How Can the Grass Roots Work?

At a recent chapter meeting an alert program chairman had scheduled the entire meeting on the subject of National legislation. Recent issues of the *Legislative Bulletin* had alerted him to several items in which he thought the members of the chapter would be interested. He had also received from National headquarters in answer to his inquiry the specific pieces of legislation as well as commentary pertaining to the various aspects of interest to professional engineers. Three or four members of the chapter each had taken a specific piece of legislation, prepared themselves to present the proposals contained therein, and a lively discussion ensued.

During the discussion one of the chapter members indicated his strong feelings on the legislation discussed and posed the question, "How can I most effectively express my opinion on this piece of legislation?" This experience is significant for several reasons: (1) It is an example of many stimulating programs which can evolve with a little preparation and planning on the part of a program chairman using NSPE information and literature; (2) chapter discussions of this kind are carrying forward one of NSPE's basic objectives of an alert, informed profession, able to be vocal in not only engineering circles but other circles on important National proposals; (3) if followed through, an opportunity is provided for individual engineers to express their opinions on important National problems, such that their National Society as well as their state society and local chapter can have an impact on the legislation proposed.

In answer to the member's inquiry as to how his opinion can be best expressed, he has several opportunities. Most direct is for him to put his thoughts on paper, which can be addressed to several groups concerned with the problem. He can write a letter directly to his congressman, sending copies to National headquarters and his national director as an indication of his opinion on a particular subject. He can urge his chapter to express an opinion as a chapter; the chapter action then can be transmitted to the congressman and senator from the state and serve as guidance for the chapter director to the state society for consideration the subject may receive there. A more formal step may be the adoption by the chapter of a resolution asking the state society to endorse its position, and in turn the state society to request the National Society to take a similar position.

A disturbing aspect of this experience was the fact that relatively few members of the Society in attendance at the chapter meeting had made a request to be added to the mailing list to receive NSPE's monthly *Legislative Bulletin*. Through the *Bulletin* individual members of the Society can keep abreast of National proposals, either in the legislative branch or the executive branch of the Federal Government, as they effect engineers.

Grass roots is more than just a slogan in NSPE. It can and does have an effect on NSPE policy, on the image of the profession in the community, and on many problems facing the profession. All it takes is leadership, ingenuity and a genuine concern for professional problems.

Providing Engineering Advice to Public Officials
Clark A. Dunn, P.E., Chairman, Committee on the Merging Role of Science and Engineering
Resolutions
L. W. Veigel, P.E., Chairman, Resolutions Committee
REPORT OF EXECUTIVE COMMITTEE
ORDER OF SUCCESSION OF VICE PRESIDENTS
APPOINTMENT OF RESERVE FUND MEMBER
APPOINTMENT OF EXECUTIVE DIRECTOR
APPOINTMENT OF SECRETARY
ELECTION OF NOMINATING COMMITTEE
NEW BUSINESS
4:30 p.m.—MEETING OF DELEGATES
ADJOURNMENT
5:30 p.m.—Cocktail Hour
6:30 p.m.—Banquet
Installation of NSPE Officers for 1961-1962
Presentation of NSPE Award
Response: Leif J. Sverdrup, P.E., President, Sverdrup & Parcel, Inc.
Entertainment

WOMEN'S CONVENTION PROGRAM
July 3-7, 1961

Monday, July 3

Tour of Lake Washington by boat and Lunch at The Flame, Kirkland, Wash.
Leave the Olympic Hotel, by cab, at 11:00 a.m.
Leave on the Seacrest from dock at Lake Union at 11:30 a.m.
Reurn to Hotel about 4:30 p.m.
Mrs. Herbert C. Westfall in charge.
Total cost $5.00

Tuesday, July 4

Progressive Luncheon (Limited to Wives of Members of the Executive Committee)
Leave the Olympic Hotel by private cars at 10:30 a.m.
The first course will be served at the home of Mrs. Edwin L. Strandberg, Richmond Beach; the second, at the home of Mrs. John R. Wallace, Jr., View Ridge; and the third, at the home of Mrs. Merrill N. Musgrave, Capitol Hill.
Return to Hotel about 4:00 p.m.
Mrs. Morley D. Chapman in charge.
This luncheon is offered to the Executive Committee Wives by the Seattle Chapter. Consequently, there is no charge.

Wednesday, July 5

(Limited to 80 persons)
Trip to Snoqualmie Pass by bus, ride on the Ski Lift, Luncheon at The Thunderbird.
Leave the Olympic Hotel at 10:00 a.m.
Return about 4:00 p.m.
Please wear warm clothes and flat-heeled shoes on this trip.
Mrs. Eugene D. Irwin in charge.
Total cost ..... $7.50.

Thursday, July 6

Meeting of members and prospective memmers of Washington State Auxiliaries to discuss the formation of a State Chapter. Hospitality Center of the Olympic Hotel, 10:00 a.m.
Mrs. Paul N. Symbol in charge.
Polynesian Luncheon and Entertainment at Trader Vic's in the Benjamin Franklin Hotel, Fifth Avenue at Virginia Street, at 12:00 noon.
Return to Hotel about 3:30 p.m.
Please do not wear hats to this luncheon.
Mrs. Merrill N. Musgrave in charge.
Total cost ..... $3.50.

Friday, July 7

General meeting of all women attending

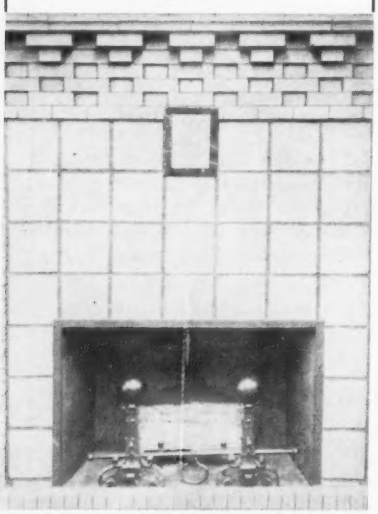
convention—9:30 a.m.—Hospitality Center. Mrs. Clark A. Dunn in charge.
Bus trip to historical and interesting spots in Seattle, Luncheon at The Wharf, Salmon Bay; a visit to the Japanese Tea Garden in the University of Washington Arboretum, and a visit to the Jade Gallery in the Seattle Art museum (This Museum is famous for its Oriental collection).
Leave Olympic Hotel at 11:30 a.m.
Return about 4:30 p.m.
Mrs. Roy E. Tuttle in charge.
Total cost $3.50

Please note: No evening events have been scheduled on the Women's Program. Please consult the Men's Program for dates and hours of joint affairs.

Hospitality Center—The foyer of the Spanish Ballroom of the Olympic Hotel will be our headquarters during the convention. Coffee and rolls, compliments of the Seattle Chapter, will be served every morning from 9:00-10:30 a.m. beginning Tuesday, July 4. Card tables and cards will be available every day, all day, for those who wish to play. The Center will be staffed by Auxiliary members from the State of Washington. Mrs. Harry L. Pratt in charge.

There will also be at the disposal of women guests at the Convention a suite consisting of bedroom and bath for resting, refreshing, and changing clothes.

Chicago Award



The Chicago Chapter, Illinois Society of Professional Engineers, presented the above award for professional development to the Underwriters' Laboratories, Inc., where it is prominently displayed in the main office and headquarters of that firm in Chicago.

By Mrs. Clark A. Dunn, Chairman, Ladies Auxiliary Advisory Committee.

When this issue of the AMERICAN ENGINEER reaches you, you will all be beginning to think about a summer vacation. Why not take the family and go to Seattle on July 4th for the annual meeting of NSPE? An interesting program is being planned for the ladies. Of course, we want all of the ladies to attend the business meeting of the auxiliary on Friday morning. At that time there will be reports of all chairmen, discussion of common problems and exchange of ideas. So, whether you have an auxiliary or are interested in forming one, do encourage your ladies to attend this annual auxiliary meeting.

Charter Night was observed in March by one of our newest auxiliaries, the Women's Auxiliary to the Joliet Chapter of the Illinois Society of Professional Engineers. Mr. LeVerne Hudson gave an interesting talk on the history of auxiliaries and presented the charter to Mrs. James Gates, president. This is the ninth auxiliary to be formed in Illinois.

Bronx Co. Chapter, NYSSPE is in the process of raising funds for their annual scholarship award. This is a joint project of the auxiliary and the chapter. This year the scholarship will be made in the name of Ernest J. Fox, deceased. Mr. Fox held the office of financial secretary of NYSSPE for 30 years.

The auxiliaries in Pennsylvania have been active. Beaver County sponsored an organ recital, the proceeds of which were turned over to the Merit Award Fund. Erie Chapter enjoyed an informative talk on rocks and minerals with samples on display from all over the United States. The Harrisburg Auxiliary held a successful fashion show, using the proceeds to buy science books for the area libraries. The Pittsburgh Auxiliary has been busy helping with the state convention. The Valley Forge Chapter was very pleased with the chapter banner which their auxiliary made and presented to them.

The Auxiliary to the Mississippi Society of Professional Engineers has chosen Mrs. W. J. Turnbull of Vicksburg as president. This was done during the mid-winter meeting held in Jackson recently.

The Dallas, Texas, Auxiliary enjoyed a musical treat when they met for a coffee in the Great Hall of St. Matthews Cathedral. They heard a concert on *The World of Music* presented by "The Allegros," a group of singing mothers from the Dan D. Rogers School.

The Riverside-San Bernardino Auxiliary of California reports a successful fashion show at which $166 was raised for their scholarship fund.

The Tacoma, Washington, Auxiliary has assumed the responsibility of stuffing and mailing NSPE convention material.—**End**

to Remember

New York Society—Annual Meeting, June 1-3, Sha-wan-ga Lodge, High View, New York.

Delaware Society—Annual Meeting, June 8, Wilmington, Delaware.

Georgia Society—Annual Meeting, June 15-18, Wilmington Island Hotel, Savannah, Georgia.

South Carolina Society—Annual Meeting, June 15-17, Francis Marion Hotel, Charleston, South Carolina.

Indiana Society—Annual Meeting, June 16-17, French Lick-Sheraton Hotel, French Lick, Indiana.

Nevada Society—Annual Meeting, June 17-18, Las Vegas, Nevada.

Utah Society—Annual Meeting, June 18, Salt Lake City, Utah.

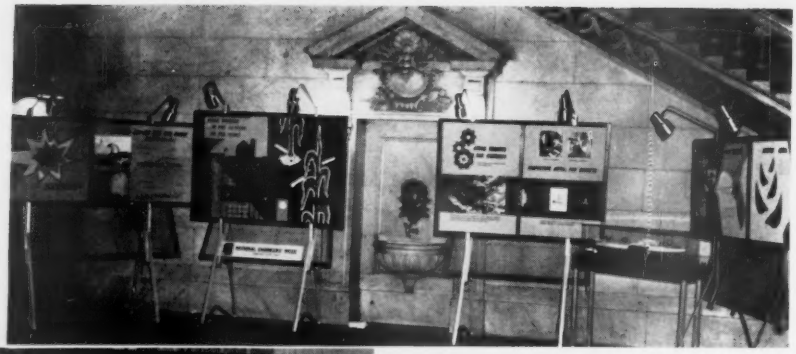
Missouri Society—Annual Meeting, June 23-24, Governor Hotel, Jefferson City, Missouri.

Hawaii Society—Annual Meeting, June 24, Honolulu, Hawaii.

National Society of Professional Engineers—Annual Meeting, July 4-7, Olympic Hotel, Seattle, Washington.

National Society of Professional Engineers—Fall Meeting, October 19-21, Hotel Roanoke, Roanoke, Virginia.

1961 ENGINEERS' WEEK ROUND-UP



Right—Part of the Engineers' Week display set up in the lobby of the St. Louis City Hall.

Left—Adam G. Kegel, president of the Baltimore Chapter of the Maryland SPE, presents a scholarship award to a senior at Loyola High School in that city. Looking on are four runner-up candidates in the competition sponsored by the Baltimore Chapter.

Right—Elementary school children view a demonstration of a wind tunnel built by an engineer and his young son in Tullahoma, Oklahoma. The device was among numerous exhibits on display at the National Guard Armory in Tullahoma during National Engineers' Week.

Left—More than 1200 engineers and their guests attended this Engineers' Week banquet which climaxed the 1961 observance in Chicago.

Right—Robert A. Brown, third from left, past national director of the Illinois SPE, presents an award to Drew Castle, counselor of the Engineers' Club of Joliet Junior College. The award was made by the Joliet Chapter.

SPECIAL REPORT

(Continued from page 33)

tion's labor market. Recent improvements in recruiting techniques, and in the Federal pay and benefits structure affecting these occupations will help improve the Government competitive position. But Federal agencies, not having the flexibility of private industry, will probably continue to experience some difficulty in competing for skills in shortage categories. Thus, the Commission feels, demand will exceed supply.

To alleviate the situation, the Commission suggests a six-point program of action that can begin at the present time: (1) Using to the fullest possible extent existing engineering skills; (2) using technicians at the highest skill level possible; (3) pinpointing recruitment efforts and recruiting vigorously in fields where the greatest future demand will exist; (4) stepping up training programs for scientific and technical personnel; (5) stressing recruiting of subprofessional personnel for technical occupations in which manpower needs are increasing rapidly; and (6) stepping up programs to inform schools, colleges and universities and the general public on the manpower requirements to be filled.

Generalizing on the premises of the survey, it appears fairly clear that the demand for engineers is going to remain high in all areas of the economy. It is also likely that the pinch for industry will be slightly less than for the Government. But regardless of who feels the pinch less, it will still be there, for it seems clear that the demand for engineers for the next few years is going to outstrip the supply.—**End.**

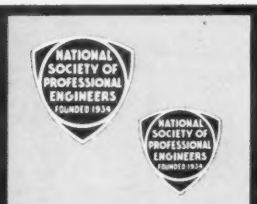
SALARIES

(Continued from page 36)

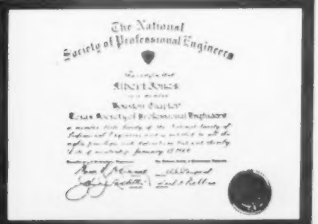
of work and job title. Attorneys, chemists, and engineers are each given six different rankings, mathematicians are given seven and accountants five. As a point of comparison, the more detailed NSPE survey sets up eight separate categories of engineers, using generally the same criteria. Making approxi-

Certificates and Emblems are available

The Professional Engineer emblem is available styled as cuff links. Can also be ordered in large 3″ size as a metal automobile emblem.



The beautiful Society shield is available in several styles. See coupon below.

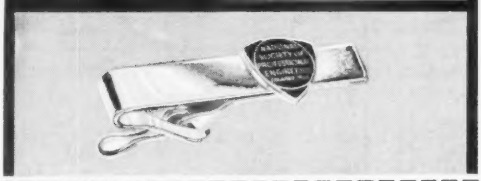


Order one of the handsome certificates showing your NSPE affiliation for your office wall.

Now available for the ladies is a beautiful Ladies Auxiliary Insignia.

The shield mounted as a tie chain makes a perfect gift. ➔

The shield worn as a tie clasp is distinctive jewelry for any professional engineer member. ➔



NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
2029 K Street, N. W., Washington 6, D. C.

I am enclosing my check in the amount of $ ——— for which please send me For Professional Engineers, P. E., and Junior Members, J. M.

J.M.	P.E.	
☐	☐	Certificate No. 1 with Chapter and State designation, priced at $1.50
☐	☐	Certificate No. 2 with State designation, priced at $1.50
☐	☐	American Engineer Binder, priced at $3.00
☐	☐	Shield, mounted as a charm, priced at $5.00
☐	☐	Shield, mounted as a pin, priced at $5.00
☐	☐	Miniature Shield, mounted on lapel button (⅜″), priced at $2.50
	☐	Miniature Shield, mounted on tie clip, priced at $2.50
	☐	Shield, mounted on tie chain, priced at $2.50
	☐	Professional Engineer Emblem cuff links (set), priced at $3.00
	☐	Automobile Emblem (3″), priced at $1.00
☐		Ladies Auxiliary Insignia, mounted as a pin, priced at $5.00
☐		Ladies Auxiliary Insignia, mounted as a charm, priced at $5.00

PLEASE MAIL TO ———

ADDRESS ——— REG. NO. ———

CITY ——— STATE ——— ZONE ———

I am a member of the ——— (State) Society of Professional Engineers.

(and if Certificate No. 1 is desired) ——— (Chapter)

Charms and pins (exclusive of lapel buttons) engraved upon request

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Positions Wanted: Undisplayed, 90¢ per line. Three or more consecutive insertions 75¢ per line each.
Displayed: General Advertising rates, less 50%.
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Distribution Engineer. Excellent opportunity for a young electrical engineer with 3 to 5 years experience in overhead distribution engineering in a public utility, in a fast-growing southwest area. Should have working knowledge of underground distribution system. Salary open. Box 501, AMERICAN ENGINEER.

MECHANICAL ENGINEER. Excellent opportunity at Project Engineer level for BSME with minimum 10 years experience, preferably in heating, ventilating, and air conditioning. Position permanent and open immediately with established Midwest consulting firm designing industrial plants, power houses, public buildings, office buildings, laboratories. Moving expenses paid. Write Box 301, AMERICAN ENGINEER.

BRIDGE AND HIGHWAY ENGINEERS

Several experienced highway bridge and road engineers wanted by established Consulting Firm, Chicago location. Excellent benefits and permanent position for qualified applicants. Give education, experience and approximate salary requirement. Write Box 603, AMERICAN ENGINEER.

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1200 N. Broad St. — Philadelphia 21, Pa.

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Creative,
Practical,
Graduate Engineer

is required by corporate staff engineering of a National company located in Rockefeller Center, New York.

MUST HAVE at least 5 years experience in design and development, light and heavy apparatus and fabricating equipment. Experience in manufacturing methods and processes in plastics or rubber helpful but not required. Must be willing to travel.

Submit complete résumé with college transcript and salary requirements to Box 601, AMERICAN ENGINEER.

Positions Wanted

Association with Consulting Engineer or Architect in a Southern community desired by a young, currently employed, Registered Professional Engineer with experience in mechanical, electrical and machine design and field supervision on industrial and educational projects up to $4,000,000. Small initial investment possible. All identified responses will be held confidential and answered. Write Box 500, AMERICAN ENGINEER.

MECHANICAL ENGINEER, P.E. Pennsylvania and Louisiana, age 40, experience in industrial facilities engineering and instrumentation. Prefer Middle Atlantic, South, or Southwest. Write Box 600, AMERICAN ENGINEER.

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mate comparisons by these grades, this is the way the salaries compare.

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ployed, the smaller percentage representing those engineers who would have been covered in the BLS comparison.

Generally, the engineer is doing fairly well for himself. While overall engineering salaries tend to lag a bit behind such professions as law, medicine and dentistry, they also tend to run ahead of many other salary groups. Teachers, accountants, and most administrative and clerical positions, as defined by the Bureau of Labor Statistics, simply don't measure up with the professional level of engineering salaries.

Unfortunately, there are areas of the engineering profession that don't keep pace, with either the majority of the engineering profession or with other job categories. Most notable of these are engineers working with the government or as teachers. The survey conducted by Engineers Joint Council offers, by median, the best statement of this discrepancy as it exists for the teaching engineer. For the general salary level by year of entry in the total profession, the medians for 1959, 1958 and 1957 are $6725, $7125 and $7475, respectively. But for the engineer/teacher, the comparable figures are, in the same order, $5750, $6425 and $6600. And for the engineer in government, the picture isn't much better. Again, using the same figures, the medians for the government engineer are $6275, $6500 and $6675.

At the higher levels, the gap is even more apparant. For the engineering profession as a whole, the engineer who entered the profession during or prior to 1924 and remained in the upper decile of the salary scale could expect to be making over $21,000 today. This is to say that 90 per cent of his colleagues are making less than that amount. For the engineer educator, the comparable figure is just over $19,000, and the government with its more rigid stratification can only offer just under $14,000 to the similar career-minded engineer.

One obvious and embrassing result of this state of affairs has recently been pointed up by Sen. Mike Monroney (D-Okla.) who cited instances where a civil service engineer will be working next to and under comparable responsibili-

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ties with an industry counterpart and be making roughly half the salary of the other man. In education, the problem is basically the same, and in both cases, it is clear that the engineer must deliberately place himself at a financial disadvantage if he is considering a career in government or teaching.

These, however, represent relatively small segments of the profession. As a whole, engineering offers, from a salary standpoint, one of the most rewarding careers to be found. For the engineer who begins his career with a bachelor of science degree, the outlook is excellent. For the engineer who takes the time needed to study for his Ph.D., the outlook is even rosier: Starting salaries will be solidly in the $10,000 bracket, and according to EJC, the top ten per cent of those Ph.D.'s with about 25 years' experience have a salary range that zooms merrily off the graph. If this is the extreme, certainly it is an extreme symptom of a healthy profession, one which offers many advantages to the man who is an active member.—**End**

DIXIE

(Continued from page 32)

land of opportunity for many engineers. On the other hand I would caution engineers seeking relocation to personally visit the state and fully explore the opportunities in their particular specialty field. Shortages in engineering talent do exist but these are not across the board."

Director of the industrial division of the Alabama Chamber of Commerce, L. B. Dickson, offers this comment on the opportunities in his state: "We do not consider that our state has all of the skilled engineering talent it needs, however, a full answer to the question becomes involved in the matter of profitably using additional engineering skill. Basically what we need is additional industry and entrepreneurs. Unfortunately, skilled engineers are seldom at the same time entrepreneurs. . . . We confidently expect the opportunities for engineering talent to broaden considerably in our state as time goes on, and in so speaking, we

are thinking in terms of using engineering talent for what it is worth and not the misuse of such talent as we suspect to be the case in some industries. . . ."

Besides the Mardi Gras each spring, Louisiana has other items to offer the engineer. James S. Janssen, P.E., president-elect of the Louisiana Engineering Society sums up the situation this way: "With increasing industrialization in this area, there is perhaps a need for more industrial engineers and for petrochemical engineers. The heavy demand for electrical engineers, both electronic and power, seems to have been anticipated and is largely supplied locally. However, there is no noticeable provincial attitude among employers or clients and there is always room for good professional engineers, regardless of category. Many out-of-state engineers become registered in Louisiana each year, some as new residents and some as nonresident practitioners."

President of the Georgia Society of Professional Engineers is Manon P. Phillips, P.E., who offers a qualified statement, but one worth considering: "There is a good bit of highway engineering and consulting engineering, particularly in regard to building construction being done in the State of Georgia. I do not anticipate any change in the type of engineering as our highway program is shaping up and increasing each year, and there is a considerable demand for highway engineers and construction people. The State of Georgia has many opportunities to offer engineers who are considering relocation. Many new industries are locating in our state and as I mentioned before, a considerable amount of building construction is being undertaken."

W. C. Lewis, president of the South Carolina Society of Professional Engineers offers this analysis of the situation in his state: "Our state has an adequate supply of engineering talent, other than engineers with advanced degrees. . . . The major employer of engineers in South Carolina is the Federal Government, however, with more and more industry moving into our state it is expected that in-

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dustry will be the largest employer within the next few years. An engineer wishing to relocate in South Carolina will find one of the best climates on the east coast, low cost of living, and fine recreational facilities . . . faced with a future of undoubtedly great industrial growth, the future for an engineer in this state is likewise excellent."

While the need for engineers in the other states surveyed may not be as great as the states whose comments have just been cited, it seems amply clear that the engineer seeking relocation would do well to take a look at this area of the nation. The opportunities are certainly available, and with the pattern of industrial growth that seems prevalent, the situation can only get better in the future. —End

UNITY

(Continued from page 41)

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7. A "Member," as defined above, residing or practicing in a state where there exists a member state society, which has in its constitution provision for accepting this class of membership, may obtain membership in the National Society only through such member state society. If he so desires, he may be a member of any number of member state societies, provided he meets the membership requirements of said member state society. A "Member" residing or practicing in a state where no member state society exists, or wherein the existing member state society does not have provision for this class of membership, or a "Member" residing or practicing in Canada, may become a "Member-at-Large."

8. A "Member" shall pay the same amount of dues as provided in the Bylaws for "Professional Engineer Members."

The American Society of Civil Engineers now requires registration as a professional engineer for admittance to its Fellowgrade of membership. At least two of the other Founder Societies are now giving very serious consideration to requiring registration as a professional engineer of all those admitted to their full grade of membership in the future. Of course, none of these provisions can be made retroactive, and all of those holding such grade of membership prior to the effective date of the requirement will continue to hold that grade of membership whether or not they are registered.

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mittee would appreciate the entire NSPE membership seriously studying this suggested plan and, if they have any comments, to send them to the Inter-Society Relations Committee, National Society of Professional Engineers, 2029 K Street, N. W., Washington 6, D. C.

It would be most helpful if members would contact their National Directors, so that they may be in a position to discuss it thoroughly at the Seattle Board Meeting in July. The decision must ultimately rest with the membership, as no such plan could be put into effect without a constitutional amendment requiring a majority of two-thirds of those voting on the amendment.

The suggestion that NSPE give serious and due consideration to such a change in its membership requirements was made by AIEE, ASME and other engineering societies in all sincerity and honesty, believing that such a change would result in a stronger, better organized engineering profession and a more effective NSPE. They are thoroughly convinced that the benefits will far outweigh any disadvantages. They have made this suggestion in a spirit of friendship and cooperation. Certainly, the NSPE membership should duly consider the suggestion in the same spirit of sincerity and honesty in which it was made. It would be a grave mistake to view the suggestion through an atmosphere clouded with preconceived ideas or prejudices. The matter is of far greater importance than that. It must be viewed from a realistic and practical viewpoint, with full appreciation of conditions as they exist today.—**End.**

BER

(Continued from page 31)

unethically *per se* in practicing electrical engineering if he was technically qualified to perform such services.

Q. 2—Engineer "A" may practice any type of engineering in which he is competent.

Q. 3—Engineer "B" is required to present exhibits or such other evidence as he may have to substantiate his charges.

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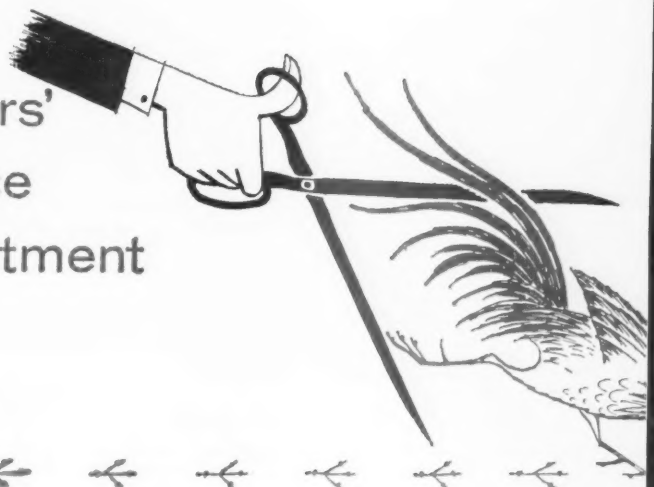

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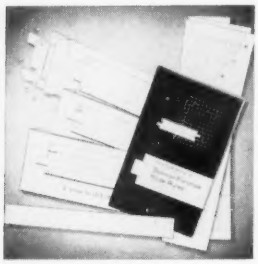

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DRAFTING TABLES — Item 31

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TABLE MODEL PRINTER — Item 32

A new table model dry diazo whiteprinter, called Starlet 60, is now available from the Paragon Revolute Division of Charles Bruning Company, Inc. The Starlet is one of the fastest table model copying machines now available for business and industry, operating at speeds as high as 55 linear feet per minute. Especially designed for office copying, and engineering blueprints up to 20″ wide by any length, over-all dimensions of the Starlet are 28⅛″ high and 40″ wide. With the feeding leaf, the depth of the machine is 41¼″.

PACKED PUMPS — Item 33

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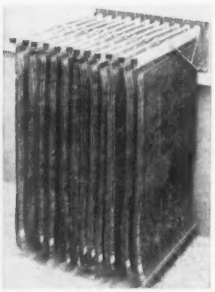
VERTICAL FILES — Item 34



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PORTABLE INSTRUMENTS — Item 35

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